# CEHv11

# Classroom Lab Setup Guide

EC-Council

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# Classroom Setup Instructions: CEHv11

This document contains setup instructions for the EC-Council Certified Ethical Hacker (CEH) course. This course requires a standard modular classroom seating configuration, one computer for each student, one computer for the instructor, a dedicated hub or switch (hub preferred), dedicated firewall, and an Internet connection. This class teaches network attack and penetration methodologies. It is imperative that the network used for this class be separated both logically and physically from any other networks in the training facility to preclude students from "accidentally" conducting exploits on other computers within accessible networks.

Before beginning the class, install and configure all computers using the information and instructions that follow.

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# Classroom Requirements

This section describes classroom equipment required for the EC-Council Certified Ethical Hacker course.

### *Classroom Equipment*

The following equipment is required for the general classroom setup:

- Climate control system adjustable within the classroom
- Lighting controls, adjustable within the classroom
- Whiteboard, 3 feet X 6 feet (1m X 2m) or larger
- Markers, whiteboard, assorted colors
- Eraser and whiteboard cleaner liquid (3 oz minimum)
- Towels and paper
- Easel with flipchart or butcher paper pad, 24 inches X 36 inches
- Felt tip pens; blue and black required, other colors optional, chisel tip (not fine-point)
- Screen, projection, 6 feet diagonal measurement (non-reflective whiteboard surface may be substituted)
- Instructor station:
    - Desk, chair, and ergonomic
    - Power outlet
    - Network jack
    - Projector, LCD, capable of 740 X 1280 pixels minimum with all connecting cables
- Student station (per student)
    - Chair, ergonomic
    - Workstation, minimum horizontal workspace 9 square feet (3 feet X 3 feet)
    - One power outlet per student station
    - One network jack per student station

## Hardware

Hardware requirements for instructor, student and victim computers are identical:

- Intel Core i5 or equivalent CPU with minimum CPU speed of 3.2 GHz
- Minimum of 8 GB RAM or more (16 GB recommended)
- Hard disk, 500 GB or larger, 7200 RPM or faster
- DVD drive (DVD R/W drive preferred)
- One Network adapter (minimum of a 10/100 NIC, but a 10/100/1000 is preferred), full duplex (disable any additional network adapters installed)
- Monitor (minimum requirement is 17-inch LCD)
- Mouse or compatible pointing device, and sound card with amplified speakers
- Internet access
- Two wireless network adapters (PCI or USB)*

The following additional hardware is also required:

- A switch with sufficient ports to allow the connection of all instructor and student workstations, plus at least five additional, unused ports for connection of additional equipment or for use as “spares.”

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*If wireless network adapters are not available for all classroom machines, at least the instructor machine must be so equipped.

## Software

All computers in the class require the following software:

- Any Windows/Linux OS/Mac OS X capable of running VMware Workstation Pro
- CEH Tools downloadable from Aspen portal
- VMware Workstation Pro v15.5.1 or later version
- Adobe Acrobat Reader DC or later version
- WinRAR v5.71 or later version
- Web browsers: Internet Explorer, Firefox, and Chrome
- Word, Excel, and PowerPoint Viewers, Microsoft Office 2016, or Open Office
- WampServer 3.1.9 or later version
- Java Runtime Environment v8u221 or later version
- Microsoft Visual C++ Packages
- MSSQL Server Express 2017

- Notepad++ v7.7.1 or later version
- Linksys Adapter
- WinPcap and Npcap
- VMware Workstation Pro (built-in role in any Windows/Linux OS/Mac OS X capable of running VMware Workstation Pro)
    - Microsoft Windows 10 Enterprise or Professional (64-bit) with full patches applied
    - Microsoft Windows Server 2019 Standard Edition (64-bit) with full patches applied
    - Microsoft Windows Server 2016 (64-bit) with full patches applied
    - Parrot Security (MATE) v4.10 (64 bit) (available with the CEH Tools) with full patches applied
    - Android 9.0 (64-bit) (available with the CEH Tools) with full patches applied
    - Ubuntu 20.04.1 (64 bit) (available with the CEH Tools) with full patches applied

**Note**: All the above-mentioned tools except the Windows operating systems (Windows 10, Windows Server 2019, Windows Server 2016, Parrot Security, and Ubuntu), Microsoft Office 2016, and Open Office are available in the CEH Tools downloads from Aspen portal.

## Classroom Connectivity

As this class teaches network attack methodologies, the network for the class must be logically and physically separated from any other networks present in the training facility and must have its own connection to the Internet.

## Configuration

This section describes the procedures for setting up the instructor, victim, and student computers as well as general directions for the configuration of the firewall appliance.

This guide assumes that you will use disk-imaging software to create images of the classroom computers for future use. To that end, configuration tasks (CTs) common to all computers are presented first. Perform these tasks on the computer that will become the instructor computer. Create a disk image after setting up a single student computer. You may then deploy this image to remaining classroom machines while completing configuration of the instructor computer.

Because the instructor computer is configured as a DHCP server that provides IP addresses to the student machines, its installation and configuration must be completed before final configuration of the student machines can begin. The victim machine uses a static IP address, and, therefore, can be configured at any time after the base image has been deployed.

# Setup Document Overview

This document provides background information for the technical staff responsible for setting up a training room facility for the CEH course. This guide describes the requirements for the network equipment and computer stations that are installed and configured by the facility's personnel for the training courses.

# Training Room Environment

The training room environment consists primarily of the following equipment:

- Instructor computer
- Student workstations

| Equipment | Number (Class of 12 Students) | Operating System | Minimum System Requirements |
|---|---|---|---|
| Instructor Computer | 1 | Any Windows/Linux OS/Mac OS X | Intel Core i5 or equivalent PC with 500 GB free disk space, minimum 8 GB RAM (16 GB recommended), one NIC, 17-inch monitor, two wireless network adapters (PCI or USB,) and one compatible mouse |
| Student Workstations | 12 | Any Windows/Linux OS/Mac OS X | Intel Core i5 or equivalent PC with 500 GB free disk space, minimum 8 GB RAM (16 GB recommended), one NIC, 17-inch monitor, one wireless network adapter (PCI or USB) and one compatible mouse |

# Instructor Computer

**The instructor computer must:**

- Install **any Windows/Linux OS/Mac OS X** capable of running VMware Workstation Pro, updated with the latest service packs and patches
- Download ISO file from ASPEN for the and Android operating system (see CT#4 in the Configuration Task section)
- Download all CEH Tools from Aspen to the **D:\CEH-Tools** folder on your hard drive for easy access (see CT#17 in the Configuration Task section)
- Install VMware Workstation Pro on the host machine (see CT#5 in the Configuration Task section)
- Configure the virtual network in the VMware Virtual Network Editor (see CT#6 in the Configuration Task Section)

- Install guest operating systems (Windows Server 2019, Windows Server 2016, and Window 10) on the VMware Workstation (see CT#7 in the Configuration Task section)
- Configure the logon account Username: **administrator** and Password: **Pa$$w0rd** for all the Windows virtual machines
- Configure **Internet Explorer Enhanced Security Configuration** (see CT#8 in the Configuration Task section)
- Run IP protocol
- Install IIS (Internet Information Services), File Services, SNMP, and Remote Access roles on Windows Server 2016 (Virtual Machine) (see CT#9 in the Configuration Task section)
- Install guest operating systems (Parrot Security, Ubuntu, and Android) on the VMware Workstation (see CT#10, CT#11, and CT#12 in the Configuration Task section)
- Turn off the firewall on all Windows virtual machines (see CT#13 in the Configuration Task section)
- Install Windows components in all the Windows virtual machines (see CT#14 in the Configuration Task section)
- Install WinRAR on the Windows 10 virtual machine and create a partition in the Windows 10 virtual machine (see CT#15 and CT#16 in the Configuration Task section)
- Have CEH-Tools shared as the '**Z:\**' drive on the Windows machines (Mapping Z:\ drive) (see CT#18 in the Configuration Task section)
- Have CEH-Tools shared in Android (see CT#19 in the Configuration Task section)
- Install Adobe Acrobat, WinRAR, Notepad++ and WinPCap in all the Windows machines (both can be found in the **Lab Prerequisites** directory in the **Z:\CEH-Tools** folder) (see CT#20, CT#21, CT#22 and CT#24 in the Configuration Task section)
- Install the latest versions of Web browsers: Firefox and Chrome (see CT#23 in the Configuration Task section)
- Have Windows Explorer set to show all files, file types, and extensions (see CT#25 in the Configuration Task section)
- Install Java Runtime Environment on all the Windows Virtual Machines (see CT#26 in the Configuration Task section)
- Disable password complexity on all Windows virtual machines (see CT#27 in the Configuration Task section)
- Create demo user accounts on all machines (see CT#28 in the Configuration Task section)
- Install Active Directory and Create User Accounts on the Windows Server 2016 virtual machine (see CT#29 in the Configuration Task section)
- Install and configure SNMP Services on the Windows Server 2019 and Windows Server 2016 virtual machines (see CT#30 in the Configuration Task Section)
- Install SQL Server Express 2017 on the Windows Server 2019 virtual machine (see CT#31 in the Configuration Task section)

- Enable Remote Desktop Connection on all Windows virtual machines (see CT#32 in the Configuration Task section)
- Turn off screen savers on the Windows virtual machines (see CT#33 in the Configuration Task section)
- Verify a ping test between all the machines in your Network (see CT#34 in the Configuration Task section)
- Enable and configure FTP Server on the Windows 10 virtual machine (see CT#35 in the Configuration Task section)
- Install the GoodShopping and Moviescope demo websites on the Windows Server 2019 virtual machine (see CT#36 and CT#37 in the Configuration Task section)
- Configure all virtual machines with the hosts file (see CT#38 in the Configuration Task section)
- Install the WAMP Server, WordPress, and DVWA websites on the Windows Server 2016 virtual machine (see CT#39, CT#40, and CT#41 in the Configuration Task section)
- Take snapshots of the virtual machines (see CT#42 in the Configuration Task section)
- Connect an LCD Projector

## Student Workstations

**Student workstations must:**

- Install **any Windows/Linux OS/Mac OS X** capable of running VMware Workstation Pro, updated with the latest service packs and patches
- Download ISO file from ASPEN for the Android operating system (see CT#4 in the Configuration Task section)
- Download all CEH Tools from Aspen to the **D:\CEH-Tools** folder on your hard drive for easy access (see CT#17 in the Configuration Task section)
- Install VMware Workstation Pro on the host machine (see CT#5 in the Configuration Task section)
- Configure the virtual network in the VMware Virtual Network Editor (see CT#6 in the Configuration Task Section)
- Install guest operating systems (Windows Server 2019, Windows Server 2016, and Window 10) on the VMware Workstation (see CT#7 in the Configuration Task section)
- Configure the logon account Username: **administrator** and Password: **Pa$$w0rd** for all the Windows virtual machines
- Configure **Internet Explorer Enhanced Security Configuration** (see CT#8 in the Configuration Task section)
- Run IP protocol
- Install IIS (Internet Information Services), File Services, SNMP, and Remote Access roles on

Windows Server 2016 (Virtual Machine) (see CT#9 in the Configuration Task section)

- Install guest operating systems (Parrot Security, Ubuntu, and Android) on the VMware Workstation (see CT#10, CT#11, and CT#12 in the Configuration Task section)
- Turn off the firewall on all Windows virtual machines (see CT#13 in the Configuration Task section)
- Install Windows components in all the Windows virtual machines (see CT#14 in the Configuration Task section)
- Install WinRAR on the Windows 10 virtual machine and create a partition in the Windows 10 virtual machine (see CT#15 and CT#16 in the Configuration Task section)
- Share CEH-Tools as the '**Z:\**' drive on all Windows virtual machines (mapping Z:\ drive) (see CT#18 in the Configuration Task section)
- Share CEH-Tools in Android (see CT#19 in the Configuration Task section)
- Install Adobe Acrobat, WinRAR, Notepad++ and WinPCap in all the Windows machines (both can be found in the **Lab Prerequisites** directory in the **Z:\CEH-Tools** folder) (see CT#20, CT#21, CT#22 and CT#24 in the Configuration Task section)
- Install the latest versions of Web browsers: Firefox and Chrome (see CT#23 in the Configuration Task section)
- Have Windows Explorer set to show all files, file types, and extensions (see CT#25 in the Configuration Task section)
- Install Java Runtime Environment on all the Windows Virtual Machines (see CT#26 in the Configuration Task section)
- Disable password complexity on all Windows virtual machines (see CT#27 in the Configuration Task section)
- Create demo user accounts on all machines (see CT#28 in the Configuration Task section)
- Install Active Directory and Create User Accounts on the Windows Server 2016 virtual machine (see CT#29 in the Configuration Task section)
- Install and configure SNMP Services on the Windows Server 2019 and Windows Server 2016 virtual machines (see CT#30 in the Configuration Task Section)
- Install SQL Server Express 2017 on the Windows Server 2019 virtual machine (see CT#31 in the Configuration Task section)
- Enable Remote Desktop Connection on all Windows virtual machines (see CT#32 in the Configuration Task section)
- Turn off screen savers on the Windows virtual machines (see CT#33 in the Configuration Task section)
- Verify a ping test between all the machines in your Network (see CT#34 in the Configuration Task section)
- Enable and configure FTP Server on the Windows 10 virtual machine (see CT#35 in the Configuration Task section)

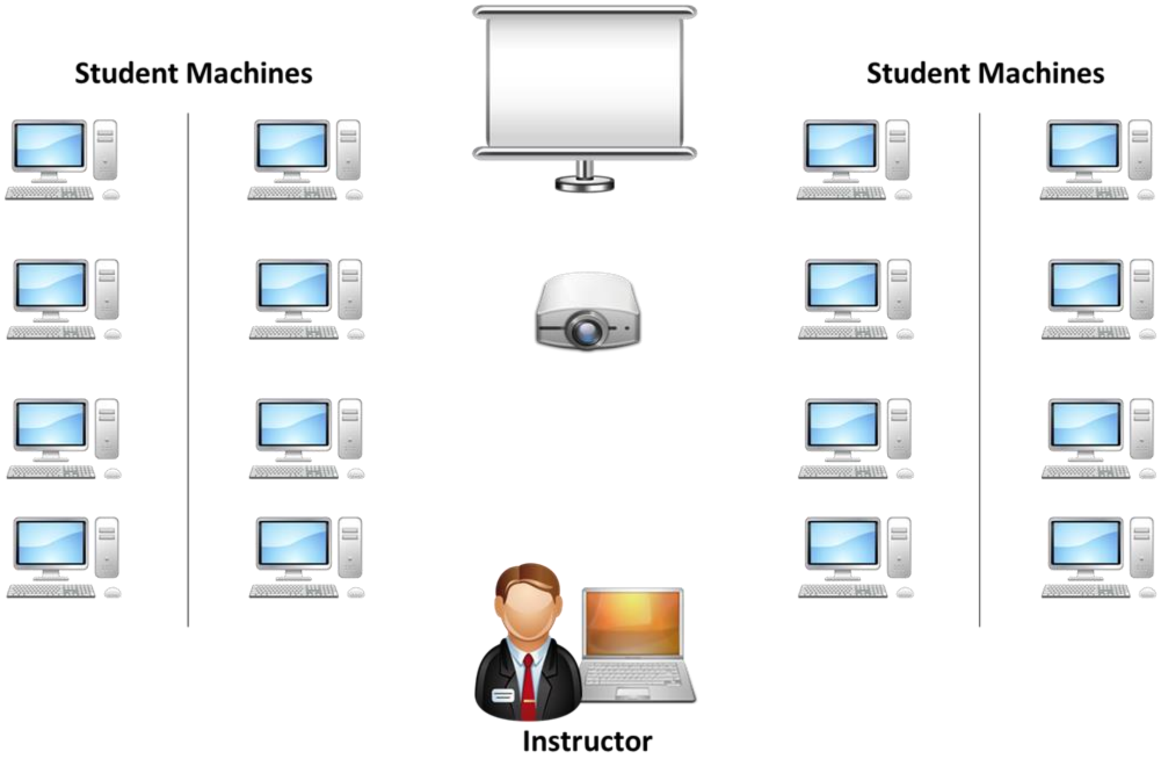
- Install the GoodShopping and Moviescope demo websites on the Windows Server 2019 virtual machine (see CT#36 and CT#37 in the Configuration Task section)
- Configure all virtual machines with the hosts file (see CT#38 in the Configuration Task section)
- Install the WAMP Server, WordPress, and DVWA websites on the Windows Server 2016 virtual machine (see CT#39, CT#40, and CT#41 in the Configuration Task section)
- Take snapshots of the virtual machines (see CT#42 in the Configuration Task section)

## Room Environment

- The room must contain a whiteboard measuring a minimum of 1 yard by 2–3 yards in length (1 meter by 2 –3 meters)
- The room should contain an easel and a large tablet (optional)
- The room must be equipped with legible black and blue felt tip pens (CHISEL-Point, not fine-tip)

## Classroom Configuration

The configuration of this classroom is modular. Computers can be added or removed either by row or column, depending on the needs of the class. The following is a sample room setup that provides optimal support. This setup allows for ease of access to "***troublespots***" by the instructor and allows students to break into functional teams of varying sizes.



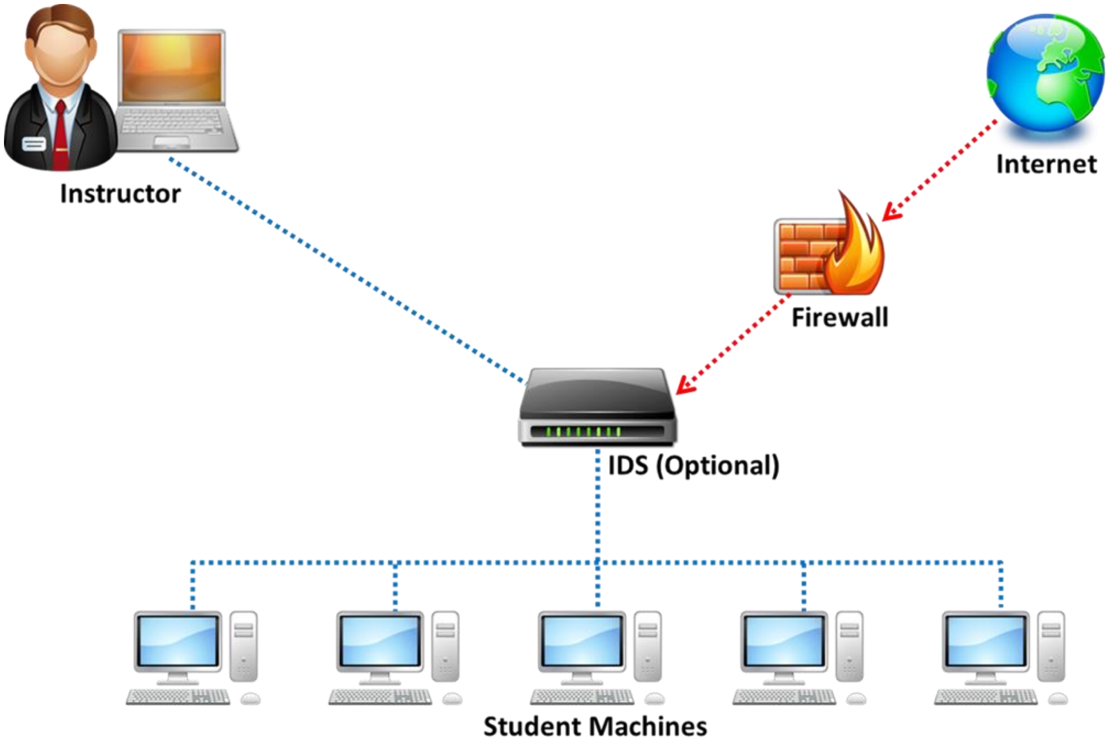
## Computer Names

Assign computer names to student machines—for example, CEHSTUDENT1, CEHSTUDENT2, CEHSTUDENT3. The instructor machine should be named INSTRUCTOR and the victim machine should be named VICTIM.

## Network Topology

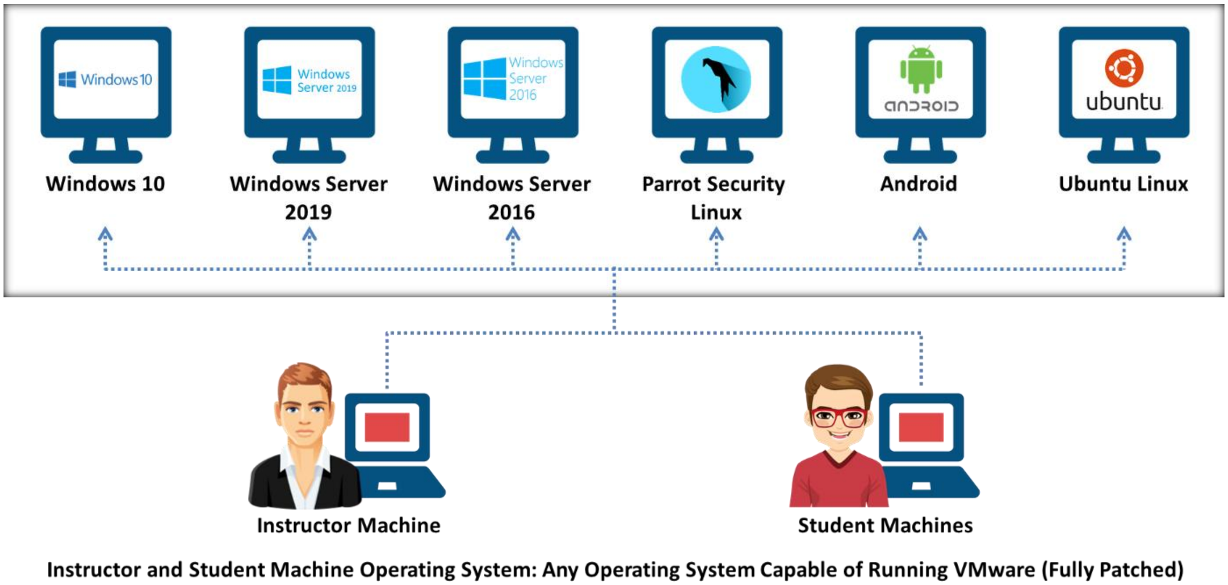
The training room must be physically isolated from any production network. Students must be able to access the Internet from their PCs. All computers are connected as one isolated network and domain. The common protocol is IP. All computers should have dynamic IP addresses using a DHCP server. Configure the DHCP server scope to 10.0.0.0/24 IP addresses. This reduces potential problems when booting the virtual machines. NICs can be 10Mbit or 100Mbit (100Mbit is recommended). A Layer-3 switch is recommended, but not required, instead of a standard switch (this is helpful for demonstrating tools in the **Sniffer** and **Session Hijacking** modules). Cables must be bundled and tied out of pathways and work areas and must be of sufficient length to avoid stress.

The training room must also have a wireless network (victim network) to demonstrate wireless hacking labs. The wireless network should be configured to use WEP keys for demonstration purposes. This network could be a part of the above network subnet. Configure the wireless router for the DHCP server scope.


Instructor
Internet
Firewall
IDS (Optional)
Student Machines

Set up the machines based on the classroom setup diagram. The lab exercises for the students are instructor-led and are based on the hacking tools in the trainer slides. The instructors are encouraged to demonstrate and guide the students on the usage of the hacking tools against the victim machines (virtual machines). Do not encourage live hacking on the Internet using these tools in the classroom. Please feel free to include your own exercises.

## CEH VM Setup on Instructor and Student Machines


Windows 10
Windows Server 2019
Windows Server 2016
Parrot Security Linux
Android
Ubuntu Linux
Instructor Machine
Student Machines
Instructor and Student Machine Operating System: Any Operating System Capable of Running VMware (Fully Patched)

## NDA Document

Download and print copies of the student NDA document and have them ready for students to sign before the class starts on Day 1. (Contact your ATC or EC-Council representative for download links).

**Note**: DO NOT CONDUCT THE CLASS WITHOUT HAVING STUDENTS SIGN THIS DOCUMENT. Training Centers (ATC) should file the NDA document at their facility.

## Instructor Acceptance

Before the training class is scheduled to begin, the instructor will visit the training facility to inspect and accept the setup. The technical contact (System Administrator) for the facility must be available to answer questions and correct any setup issues. Both the instructor and the facility technical contact will ensure the completion of the following checklists before the training setup is deemed acceptable.

## Firewall Settings

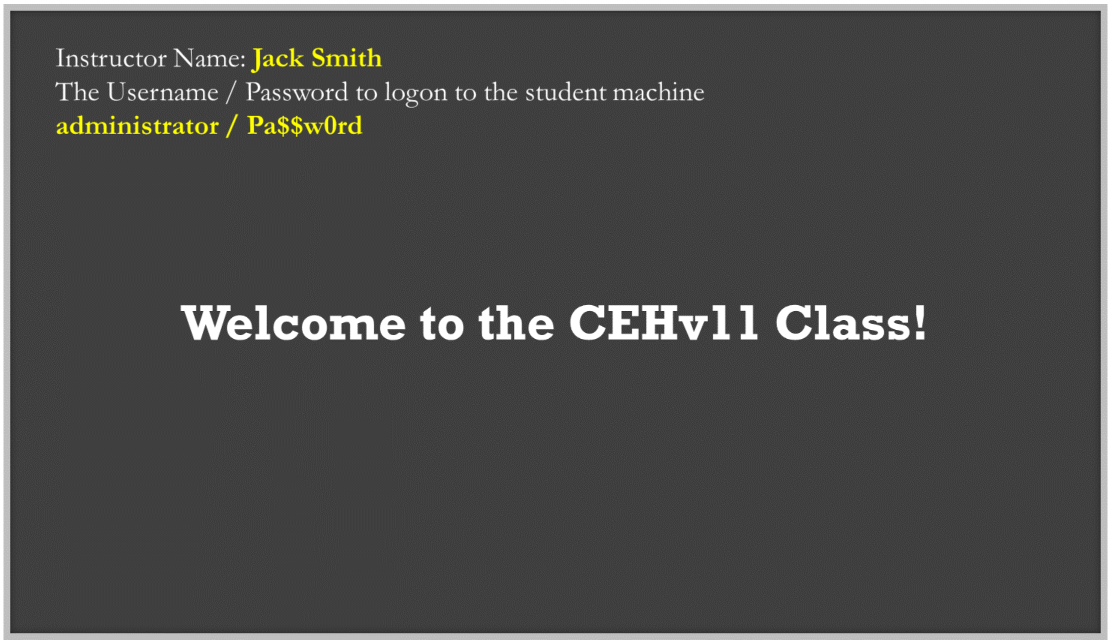
Do not block any ports while accessing the Internet through the firewall. You should be able to ping servers on the Internet

## Blackboard

Write the following in top left corner of the blackboard:

Instructor name: <Name of the instructor>

Provide Username/Password to logon to the student machine



Instructor Name: **Jack Smith**
The Username / Password to logon to the student machine
**administrator / Pa$$w0rd**

**Welcome to the CEHv11 Class!**

## Setup Checklist

The arrangement of items in the setup checklists is designed to validate that the setup has been done correctly in the most efficient manner possible. Before beginning the setup checklist, log off any connected users.

| Tick Here | List |
|---|---|
| ☐ | Verify that VMware Workstation Pro is installed |
| ☐ | Verify that all CEH tools are on the computer in the CEH-Tools folder in D:\ |
| ☐ | Verify that Internet access is available |
| ☐ | Visit https://www.eccouncil.org and view the page to check the Internet access |
| ☐ | Open Command Prompt and type nslookup certifiedhacker.com and look for a connection to the server |
| ☐ | Verify that the Acrobat Reader, WinRAR, WinPCap and command prompt extensions are installed |
| ☐ | Verify that the web browsers (Google Chrome and Mozilla Firefox) are installed |
| ☐ | Verify that the instructor computer can display through the overhead projector |
| ☐ | Verify that each computer has 500 GB or more of free disk space |
| ☐ | Verify whether you can successfully boot the Windows 10, Windows Server 2019 Windows Server 2016, Parrot Security, Ubuntu, and Android virtual machines using VMware Workstation |
| ☐ | Verify that the CEH-Tools folder is shared and mapped to the Windows virtual machines |
| ☐ | Confirm that the cable wiring is organized and labeled |
| ☐ | Confirm that the student workstation and chair placement is satisfactory |
| ☐ | Confirm that the placement of the LCD (overhead) projector is appropriate |
| ☐ | Confirm that a whiteboard and dry erase markers and erasers are available |
| ☐ | Confirm that the instructor's station is properly organized and oriented |
| ☐ | Confirm that computers are labeled with a client number |
| ☐ | Ensure that the EC-Council courseware (Official EC-Council CEHv11 Box) is available to students |
| ☐ | Confirm that the student NDA agreement is downloaded and that a copy is printed for every student in the class and placed on each student's desk |
| ☐ | Write down the facility's technical contact person's phone number. Contact them in case of a network problem |
| ☐ | Confirm that the internal network adapter is configured for the virtual machines and host |

## Instructor Acceptance

The technical contact (System Administrator) for the facility must be available to answer questions and correct any setup issues.

The instructor will inspect both the classroom and the items covered in the setup checklist(s) to ensure that the classroom and setup meet EC-Council standards. Any deficiencies discovered by the instructor must be corrected before the scheduled start time of the class.

## Assistance

If you have problems or require assistance in setting up the Lab for your CEH class, please e-mail partnersupport@eccouncil.org.

# Detailed Setup Instructions—Configuration Tasks (CT)

## CT#1: Install the Host Operating System

1. Install any Windows/Linux OS/Mac OS X capable of running VMware Workstation Pro using a DVD or USB Drive.
2. Configure the hard disk to have an active primary partition minimum of 400 GB.
3. Check for updates and, if found, update the host operating system.
4. Install the wireless network adapters according to the manufacturer's instructions.

[Back to Configuration Task Outline]

## CT#2: Copy the Host Operating System Files

1. Browse the installation DVD.
2. Copy all the source files from the DVD to the **SOURCES** folder in the drives active primary partition (e.g., Active Drive Partition Name:\SOURCES).
3. When completed, close all windows to return to **Desktop**.

[Back to Configuration Task Outline]

## CT#3: Install WinRAR on the Host Operating System

1. Download the latest version of **WinRAR** from the WinRAR official website (**https://www.win-rar.com/download.html**).

   **Note**: Download the latest version of WinRAR compatible with your host operating system from the official website (Here, we consider Windows to be the host OS).
2. Double click on the **.exe** setup file to begin the installation. If a **User Account Control** pop-up window appears, click **Yes**.
3. The **WinRAR** setup window appears, click **Install**.
4. Complete the installation by choosing the default settings throughout the installation process.
5. After completing the installation, the installation location of the WinRAR files window automatically opens; close the window.

[Back to Configuration Task Outline]

## CT#4: Download the ISO File

1. Log in to your **Aspen** account (You will see your course listed under **My Courses**) → Click the **TRAINING** button under the course to access the e-Courseware, Lab Manuals, and Tools in the **Training** area → Click the **Download Tools** tab from the left-hand pane.
2. Click the **CEHv11 ISO.zip** file from the right-hand pane to download the ISO files for the Android operating system.
3. Navigate to the location where you downloaded the **CEHv11 ISO.zip** file, right-click the .zip files, and select the **Extract Here** option.

[Back to Configuration Task Outline]

## CT#5: Install VMware Workstation Pro on the Host Machine

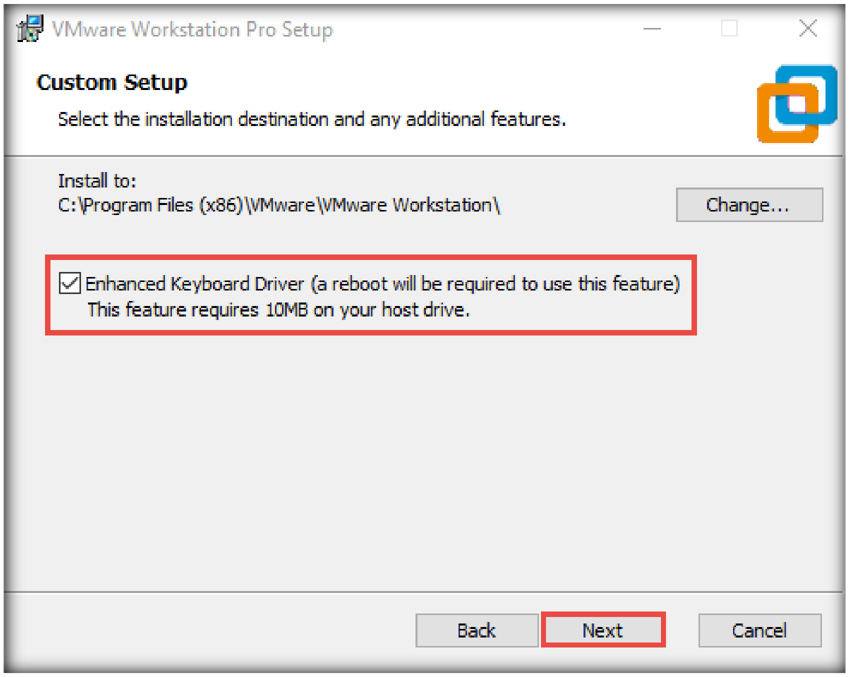
1. In your host system, go to the location where you have extracted the **CEHv11 ISO.zip** file and navigate to **CEHv11 ISO\VMware Workstation Pro**.
2. Double-click the file **VMware-workstation-full-15.5.1-15018445.exe**.

   **Note**: You can download the latest version of VMware Workstation Pro from https://www.vmware.com/in/products/workstation-pro/workstation-pro-evaluation.html.

   **Note**: If you decide to download the latest version, the screenshots in your lab environment might differ from those shown in this guide.
3. The **User Account Control** pop-up window appears. Click **Yes**.

   **Note**: If a **VMware Product Installation** notification appears, click **Yes** to restart the system.

   **Note**: After the system reboots, double-click the file **VMware-workstation-full-15.5.1-15018445.exe**.
4. VMware Workstation Pro initializes; in the installation wizard, click **Next**.
5. Accept the user agreement and click **Next**.
6. In the **Custom Setup** wizard, check the **Enhanced Keyboard Driver** option and click **Next**.
7. Follow the wizard-driven installation steps to install VMware Workstation Pro using the default settings.



Custom Setup

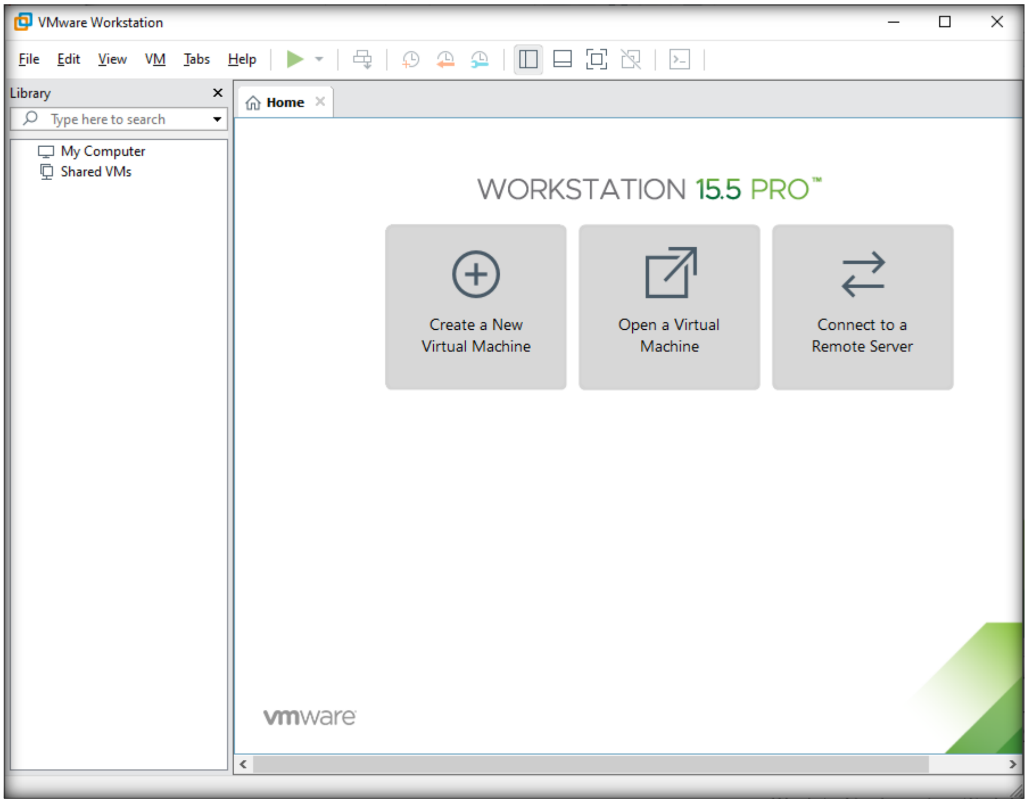
Select the installation destination and any additional features.

Install to:
C:\Program Files (x86)\VMware\VMware Workstation\

☑ Enhanced Keyboard Driver (a reboot will be required to use this feature)
This feature requires 10MB on your host drive.

VMware Workstation Pro Setup
Change...
Back
Next
Cancel

8. On completion of the installation, the machine will restart.
9. Once the machine has rebooted, launch VMware Workstation Pro.



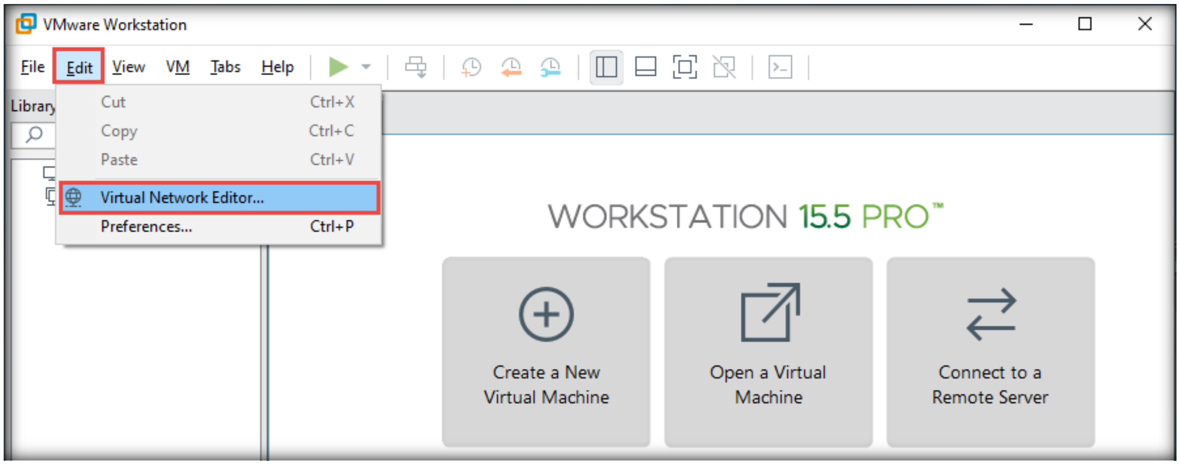
VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Shared VMs
Home
WORKSTATION 15.5 PRO™
Create a New Virtual Machine
Open a Virtual Machine
Connect to a Remote Server
vmware

**Note**: If VMware Workstation Pro prompts for an activation key; provide it, if you have purchased one, or continue with the trial version.

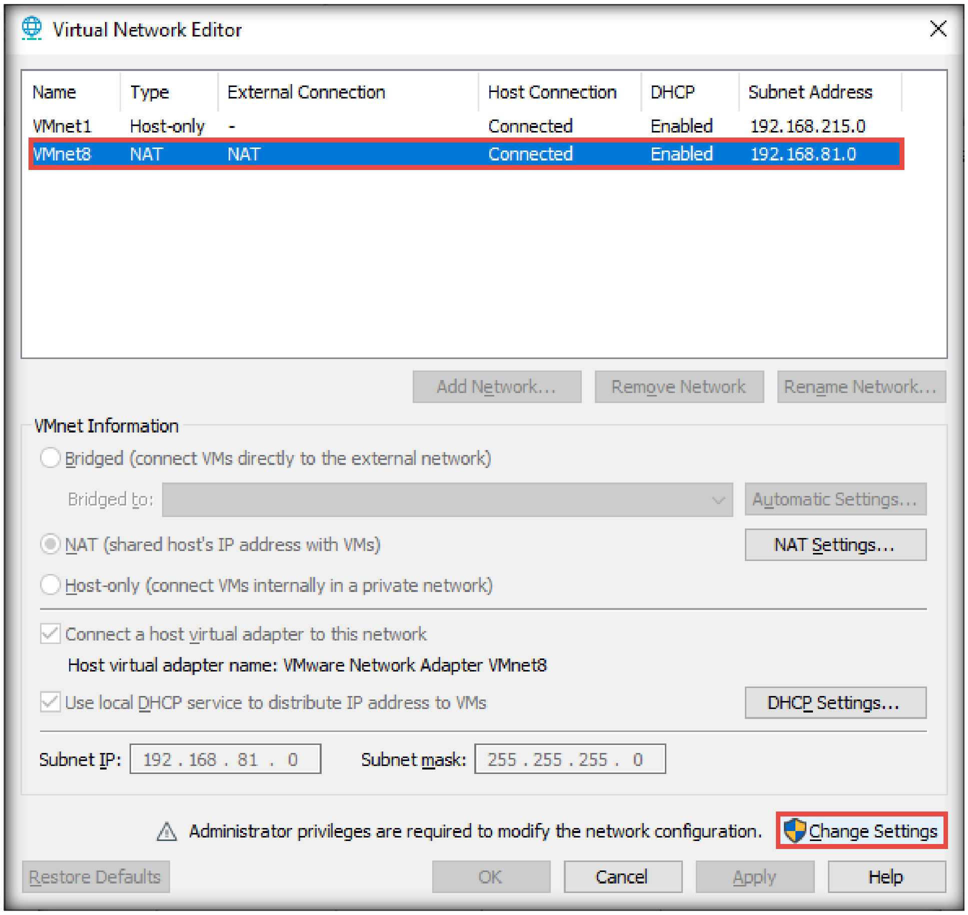
[Back to Configuration Task Outline]

# CT#6: Configure the Virtual Network in VMware Virtual Network Editor

1. Launch **VMware Workstation Pro**.
2. Navigate to **Edit** and click **Virtual Network Editor...** as shown in the screenshot.


VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Virtual Network Editor...
Preferences... Ctrl+P
WORKSTATION 15.5 PRO™
Create a New Virtual Machine
Open a Virtual Machine
Connect to a Remote Server

3. The **Virtual Network Editor** window appears; choose the **VMnet8 NAT** network and click **Change Settings** from the lower-right section of the window.


Virtual Network Editor
Add Network...
Remove Network
Rename Network...
VMnet Information
Automatic Settings...
NAT Settings...
DHCP Settings...
Change Settings
Restore Defaults
OK
Cancel
Apply
Help

| Name | Type | External Connection | Host Connection | DHCP | Subnet Address |
|---|---|---|---|---|---|
| VMnet1 | Host-only | - | Connected | Enabled | 192.168.215.0 |
| VMnet8 | NAT | NAT | Connected | Enabled | 192.168.81.0 |

○ Bridged (connect VMs directly to the external network)

Bridged to:

● NAT (shared host's IP address with VMs)

○ Host-only (connect VMs internally in a private network)

☑ Connect a host virtual adapter to this network

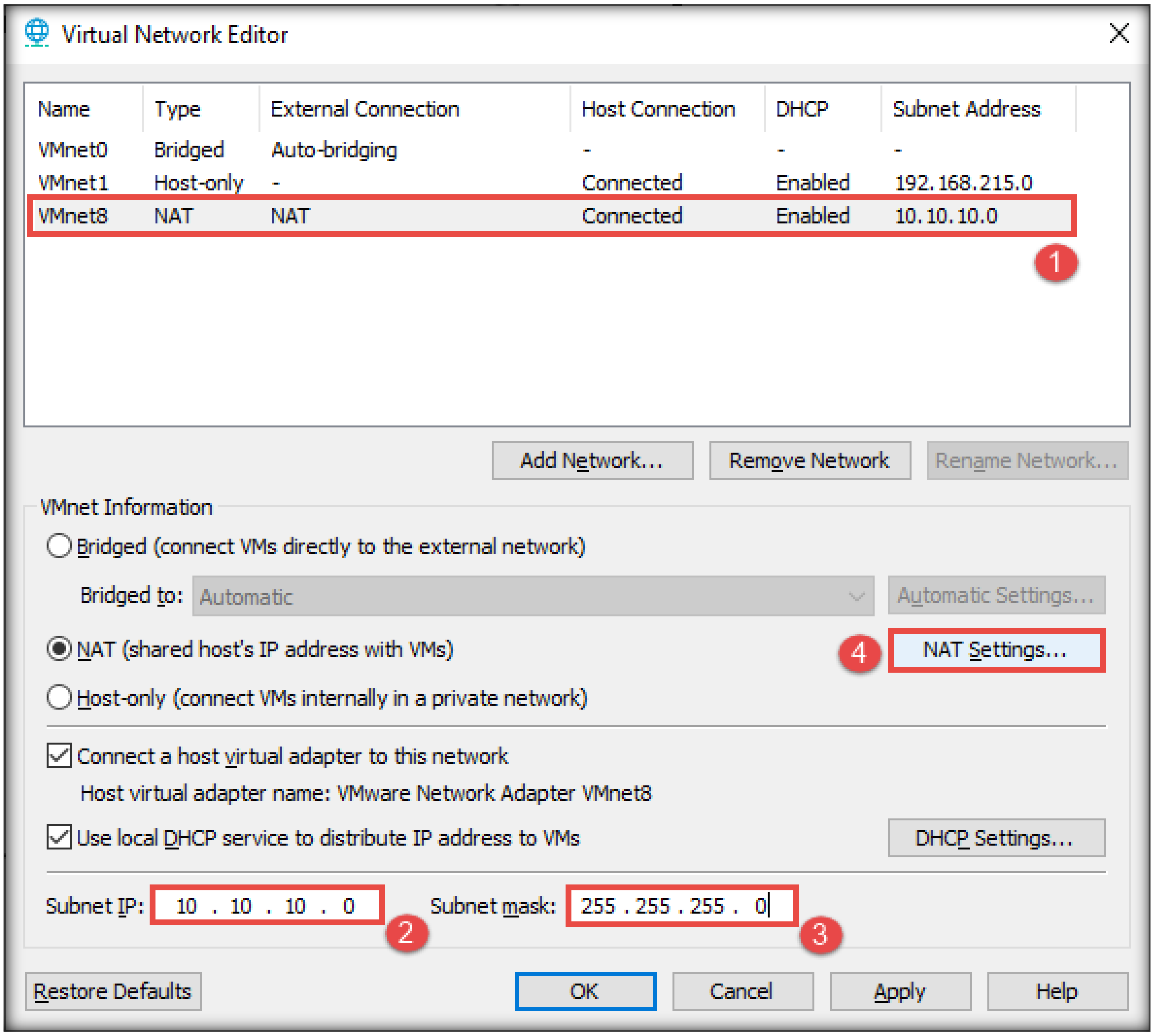
Host virtual adapter name: VMware Network Adapter VMnet8

☑ Use local DHCP service to distribute IP address to VMs

Subnet IP: 192 . 168 . 81 . 0 Subnet mask: 255 . 255 . 255 . 0

⚠ Administrator privileges are required to modify the network configuration.

4. If a **User Account Control** pop-up appears, click **Yes**.
5. In the **Virtual Network Editor** window, select **VMnet8** again in the lower section of the window, define **Subnet IP** as **10.10.10.0** and **Subnet mask** as **255.255.255.0**, and click **NAT Settings...**



Virtual Network Editor

| Name | Type | External Connection | Host Connection | DHCP | Subnet Address |
|---|---|---|---|---|---|
| VMnet0 | Bridged | Auto-bridging | - | - | - |
| VMnet1 | Host-only | - | Connected | Enabled | 192.168.215.0 |
| VMnet8 | NAT | NAT | Connected | Enabled | 10.10.10.0 |

VMnet Information

○ Bridged (connect VMs directly to the external network)

Bridged to: Automatic

● NAT (shared host's IP address with VMs)

○ Host-only (connect VMs internally in a private network)

☑ Connect a host virtual adapter to this network

Host virtual adapter name: VMware Network Adapter VMnet8

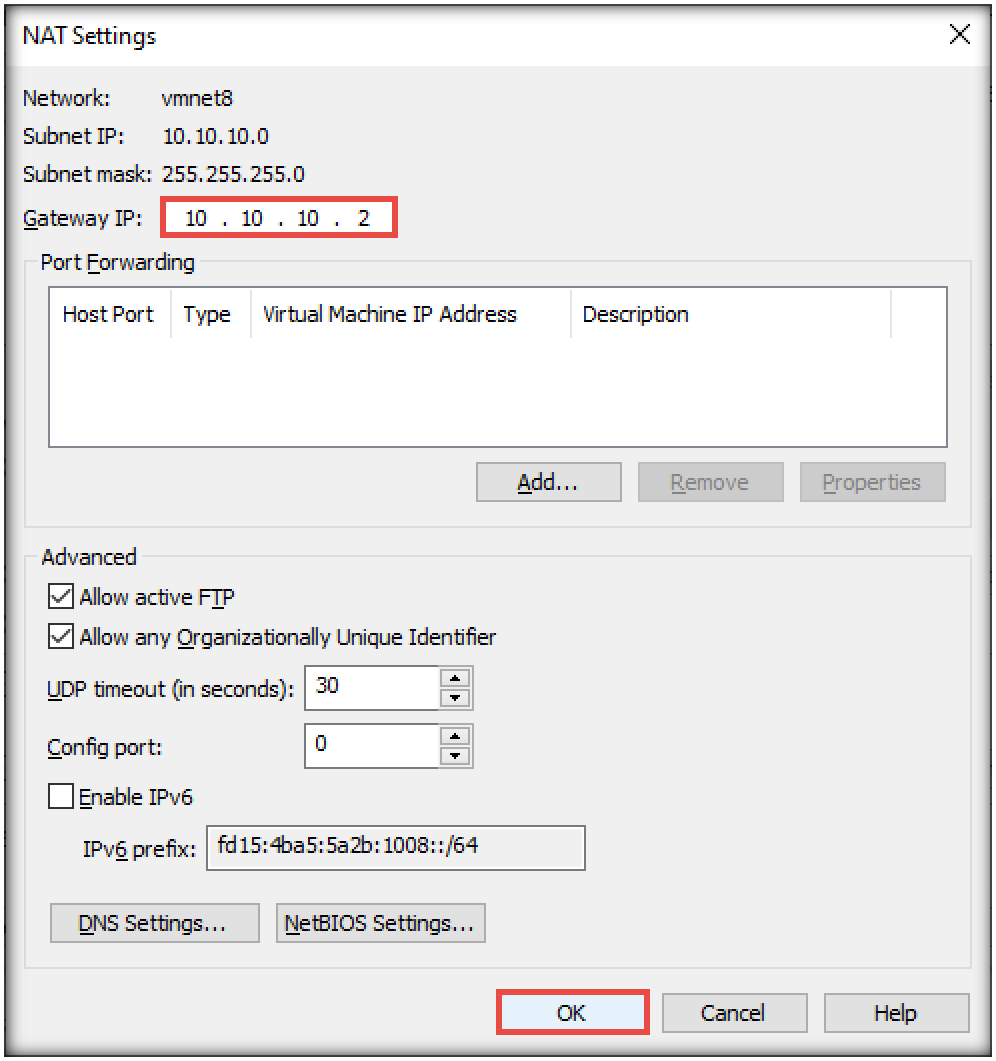
☑ Use local DHCP service to distribute IP address to VMs

Subnet IP: 10 . 10 . 10 . 0

Subnet mask: 255 . 255 . 255 . 0

1
Add Network...
Remove Network
Rename Network...
Automatic Settings...
4
NAT Settings...
DHCP Settings...
2
3
Restore Defaults
OK
Cancel
Apply
Help

6. The **NAT Settings** window appears; enter the **Gateway IP** as **10.10.10.2** and click **OK**.



NAT Settings

Network: vmnet8
Subnet IP: 10.10.10.0
Subnet mask: 255.255.255.0
Gateway IP: 10 . 10 . 10 . 2

Port Forwarding

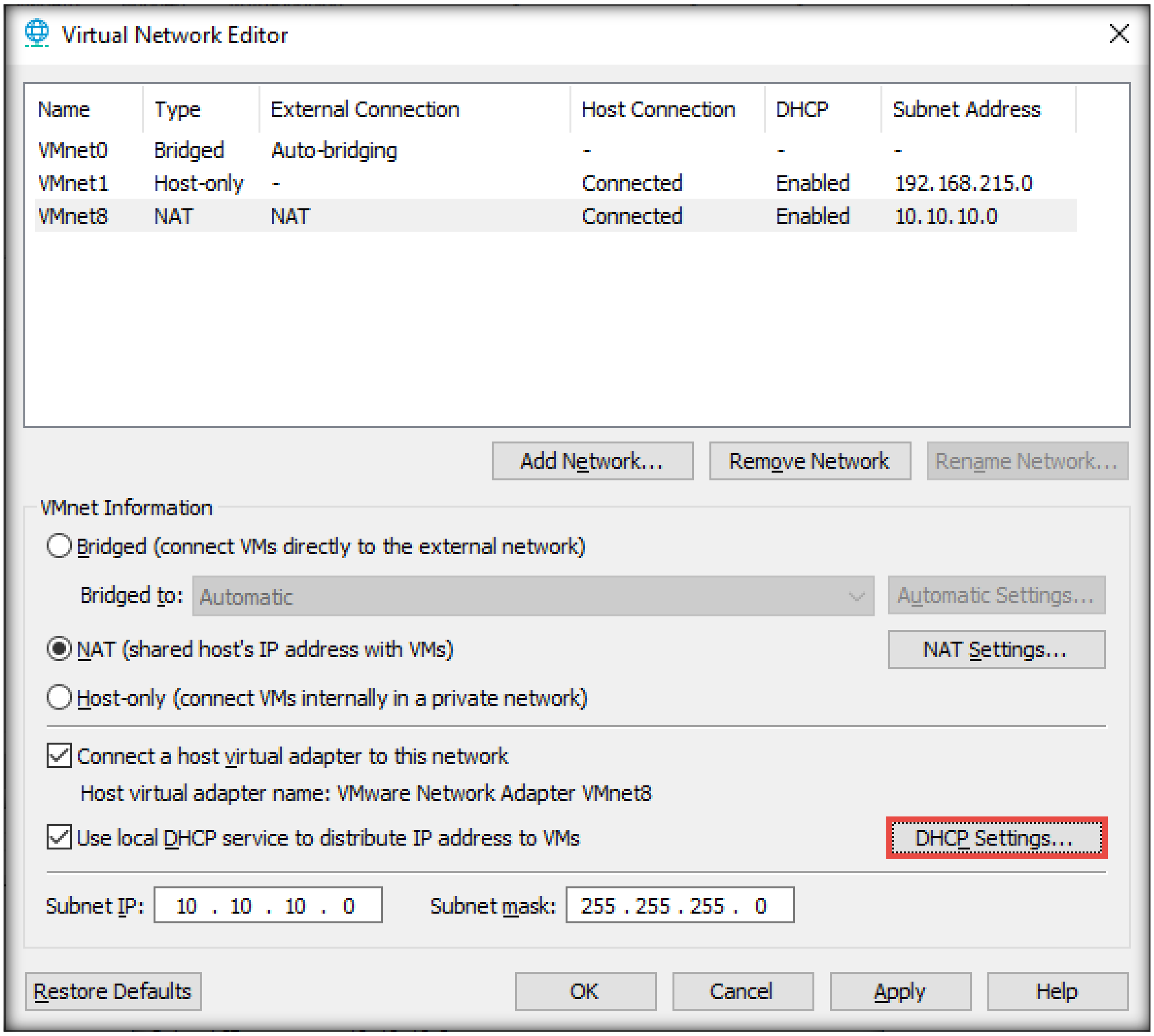
| Host Port | Type | Virtual Machine IP Address | Description |
|---|---|---|---|

Advanced

☑ Allow active FTP
☑ Allow any Organizationally Unique Identifier
UDP timeout (in seconds): 30
Config port: 0
☐ Enable IPv6
IPv6 prefix: fd15:4ba5:5a2b:1008::/64

Add...
Remove
Properties
DNS Settings...
NetBIOS Settings...
OK
Cancel
Help

7. Now we keep **VMnet8** selected and click **DHCP Settings...**



Virtual Network Editor

| Name | Type | External Connection | Host Connection | DHCP | Subnet Address |
|---|---|---|---|---|---|
| VMnet0 | Bridged | Auto-bridging | - | - | - |
| VMnet1 | Host-only | - | Connected | Enabled | 192.168.215.0 |
| VMnet8 | NAT | NAT | Connected | Enabled | 10.10.10.0 |

VMnet Information

○ Bridged (connect VMs directly to the external network)

Bridged to: Automatic

● NAT (shared host's IP address with VMs)

○ Host-only (connect VMs internally in a private network)

☑ Connect a host virtual adapter to this network

Host virtual adapter name: VMware Network Adapter VMnet8

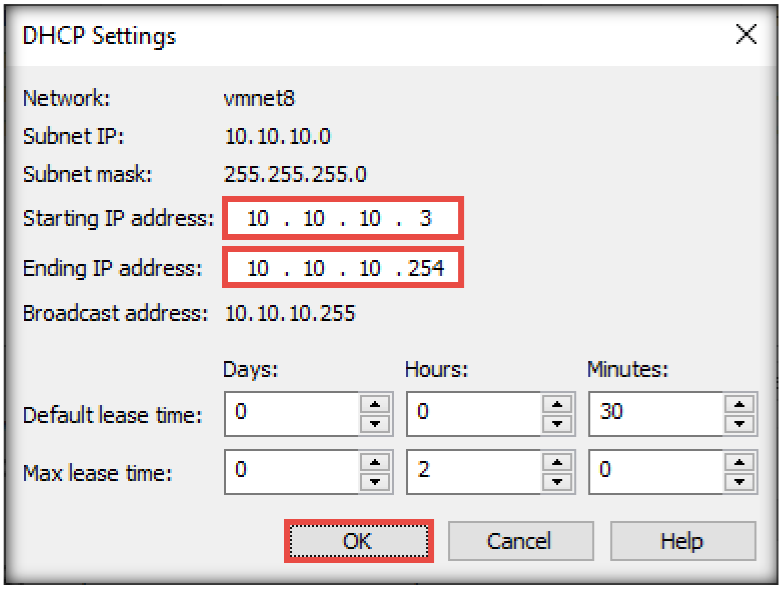
☑ Use local DHCP service to distribute IP address to VMs

Subnet IP: 10 . 10 . 10 . 0

Subnet mask: 255 . 255 . 255 . 0

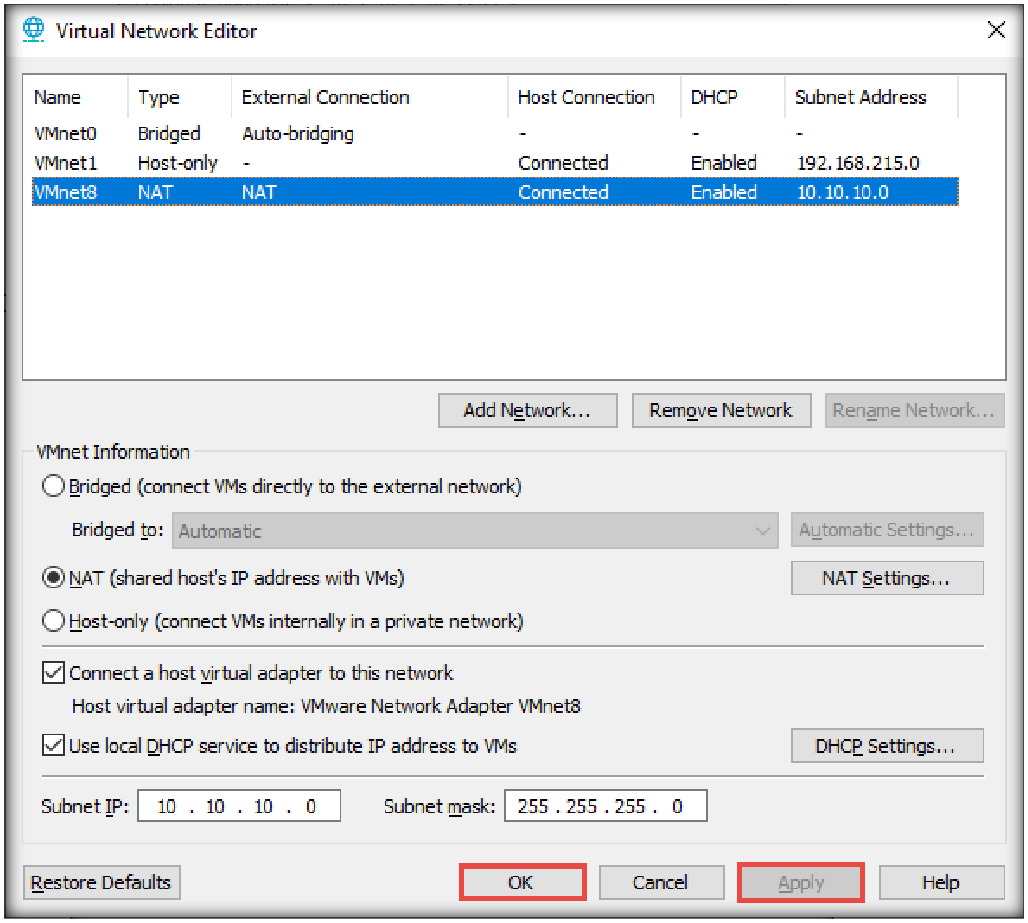
Add Network...
Remove Network
Rename Network...
Automatic Settings...
NAT Settings...
DHCP Settings...
Restore Defaults
OK
Cancel
Apply
Help

8. In the **DHCP Settings** window, define the **Starting IP address** as **10.10.10.3** and the **Ending IP address** as **10.10.10.254**, and click **OK**.



DHCP Settings
Network: vmnet8
Subnet IP: 10.10.10.0
Subnet mask: 255.255.255.0
Starting IP address: 10 . 10 . 10 . 3
Ending IP address: 10 . 10 . 10 . 254
Broadcast address: 10.10.10.255
Days:
Hours:
Minutes:
Default lease time: 0 0 30
Max lease time: 0 2 0
OK
Cancel
Help

9. Click **Apply** and **OK** in the **Virtual Network Editor** window to complete the configuration.



Virtual Network Editor

| Name | Type | External Connection | Host Connection | DHCP | Subnet Address |
|---|---|---|---|---|---|
| VMnet0 | Bridged | Auto-bridging | - | - | - |
| VMnet1 | Host-only | - | Connected | Enabled | 192.168.215.0 |
| VMnet8 | NAT | NAT | Connected | Enabled | 10.10.10.0 |

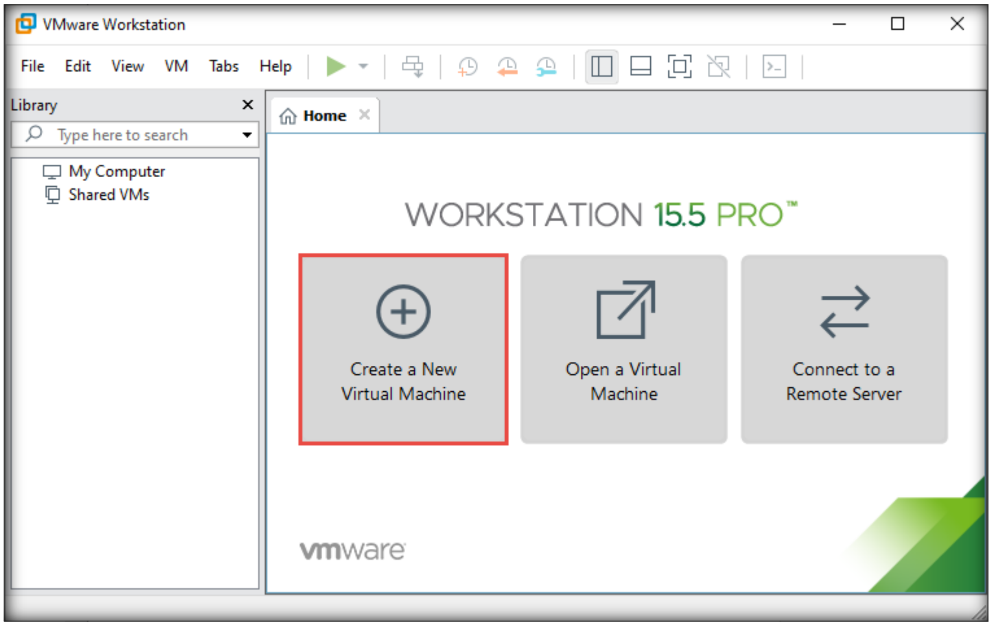
Add Network...
Remove Network
Rename Network...
VMnet Information
○ Bridged (connect VMs directly to the external network)
Bridged to: Automatic
Automatic Settings...
● NAT (shared host's IP address with VMs)
NAT Settings...
○ Host-only (connect VMs internally in a private network)
☑ Connect a host virtual adapter to this network
Host virtual adapter name: VMware Network Adapter VMnet8
☑ Use local DHCP service to distribute IP address to VMs
DHCP Settings...
Subnet IP: 10 . 10 . 10 . 0
Subnet mask: 255 . 255 . 255 . 0
Restore Defaults
OK
Cancel
Apply
Help

[Back to Configuration Task Outline]

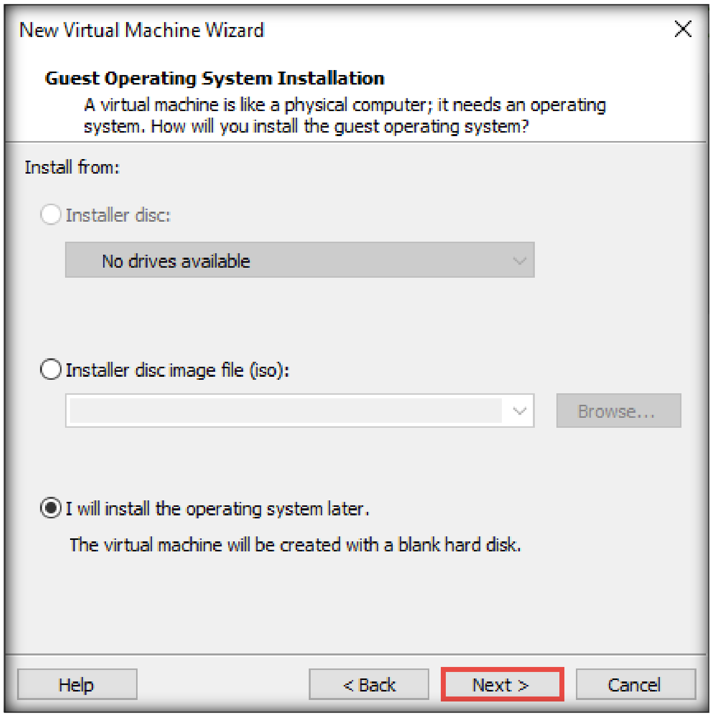
# CT#7: Install Windows Virtual Machines in VMware

## Install the Windows Server 2019 Virtual Machine

1. In the **VMware Workstation** window, click **Create a New Virtual Machine**.


VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Shared VMs
Home
WORKSTATION 15.5 PRO™
Create a New Virtual Machine
Open a Virtual Machine
Connect to a Remote Server
vmware

2. In the **New Virtual Machine Wizard** window, leave the settings to default (**Typical**) and click **Next**.
3. In the **Guest Operating System Installation** wizard, choose the **I will install the operating system later** radio button (if you have an ISO of **Windows Server 2019**) and click **Next**.


New Virtual Machine Wizard
Guest Operating System Installation
Help
< Back
Next >
Cancel
Browse...

A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?

Install from:

○ Installer disc:

No drives available

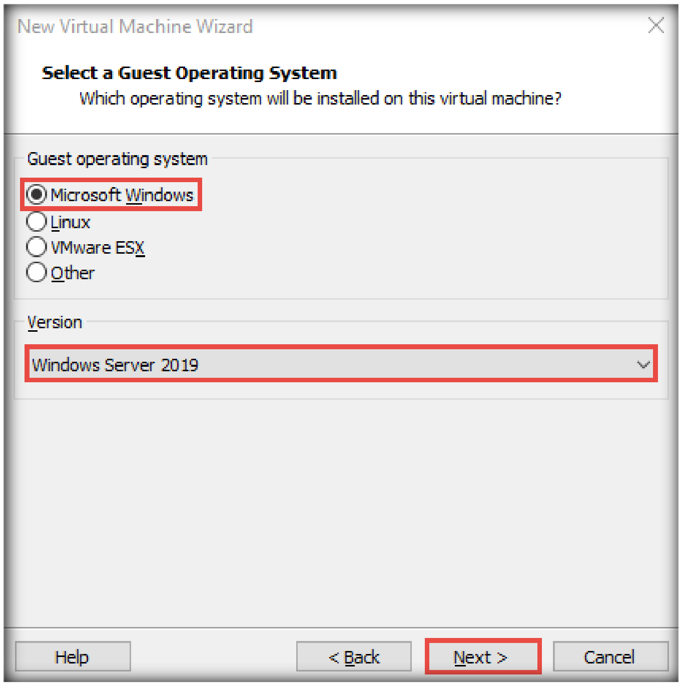
○ Installer disc image file (iso):

● I will install the operating system later.

The virtual machine will be created with a blank hard disk.

4. In the **Select a Guest Operating System** wizard, ensure that the **Microsoft Windows** radio button is selected under the **Guest operating system** section and that **Windows Server 2019** is selected the **Version** option. Click **Next**.

   **Note**: If the **Windows Server 2019** option in the **Version** field is not available, then select **Windows Server 2016** from the drop-down list.



New Virtual Machine Wizard

**Select a Guest Operating System**

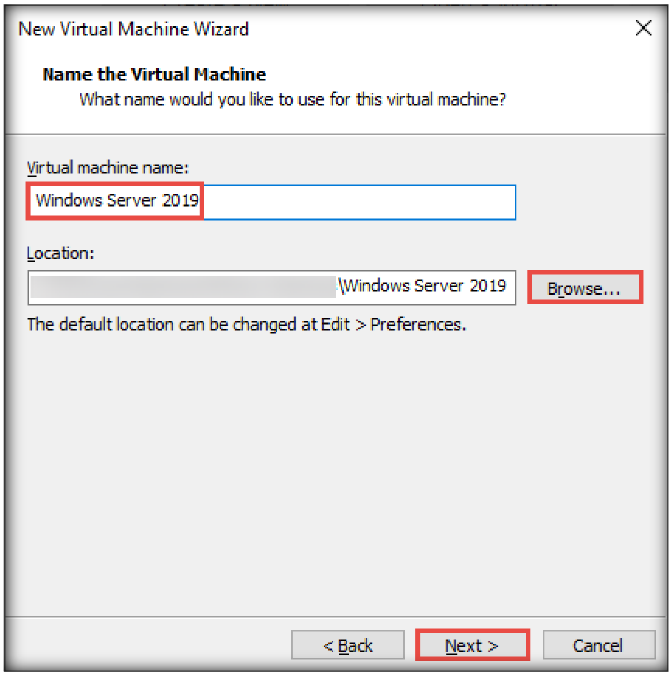
Which operating system will be installed on this virtual machine?

Guest operating system

● Microsoft Windows
○ Linux
○ VMware ESX
○ Other

Version: Windows Server 2019

5. The **Name the Virtual Machine** wizard appears; type **Windows Server 2019** in the **Virtual machine name** field and click the **Browse** button to store the virtual hard disk; choose your desired location to store the hard disk, and then click **Next**.



New Virtual Machine Wizard

**Name the Virtual Machine**

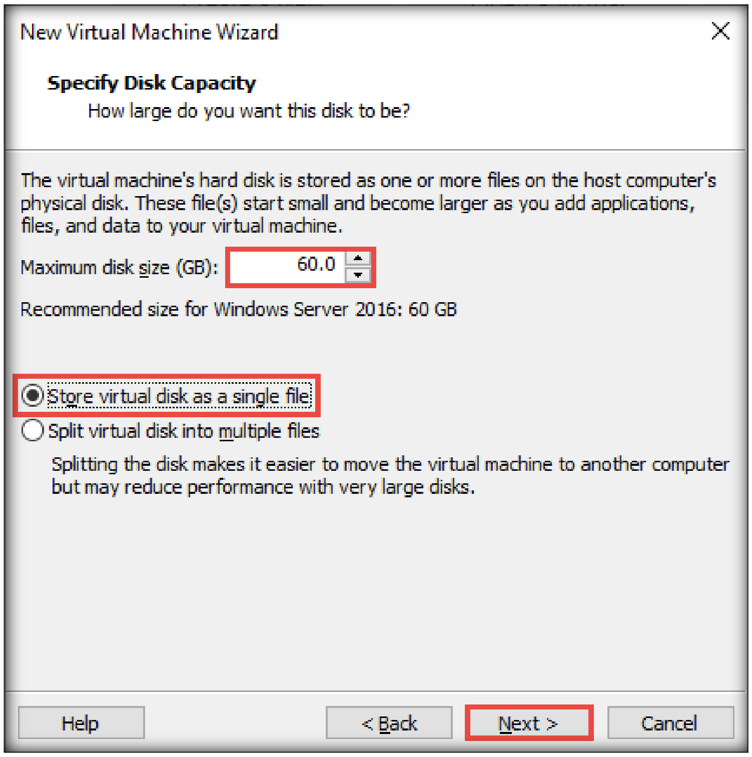
What name would you like to use for this virtual machine?

Virtual machine name: Windows Server 2019

Location: [redacted]\Windows Server 2019

The default location can be changed at Edit > Preferences.

6. The **Specify Disk Capacity** wizard appears, leave the **Maximum disk size (GB)** to default (i.e., **60 GB**, recommended), choose the **Store virtual disk as a single file** radio button, and click **Next**.



New Virtual Machine Wizard

**Specify Disk Capacity**

How large do you want this disk to be?

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (GB): 60.0

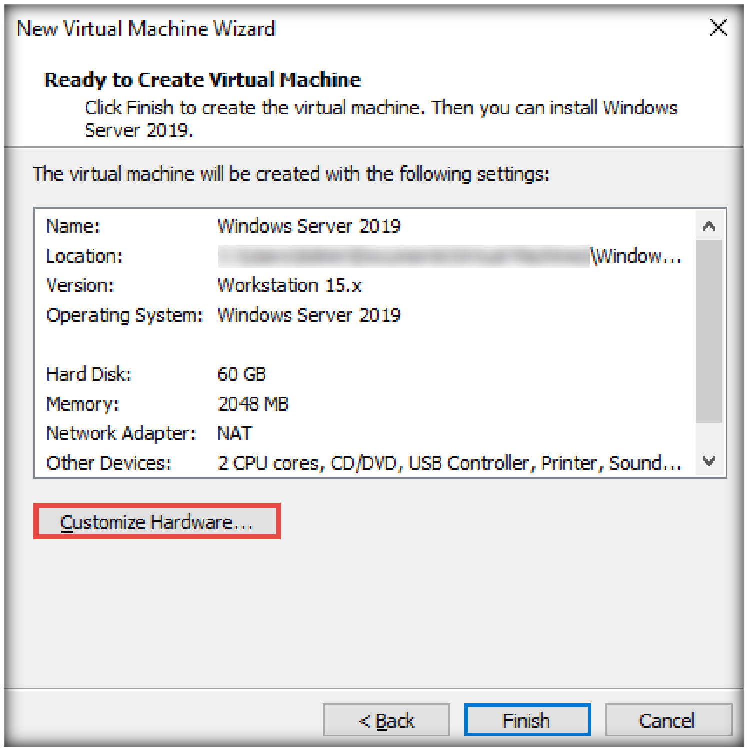
Recommended size for Windows Server 2016: 60 GB

● Store virtual disk as a single file

○ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

7. The **Ready to Create Virtual Machine** wizard appears; confirm the settings, and click the **Customize Hardware...** button.



New Virtual Machine Wizard

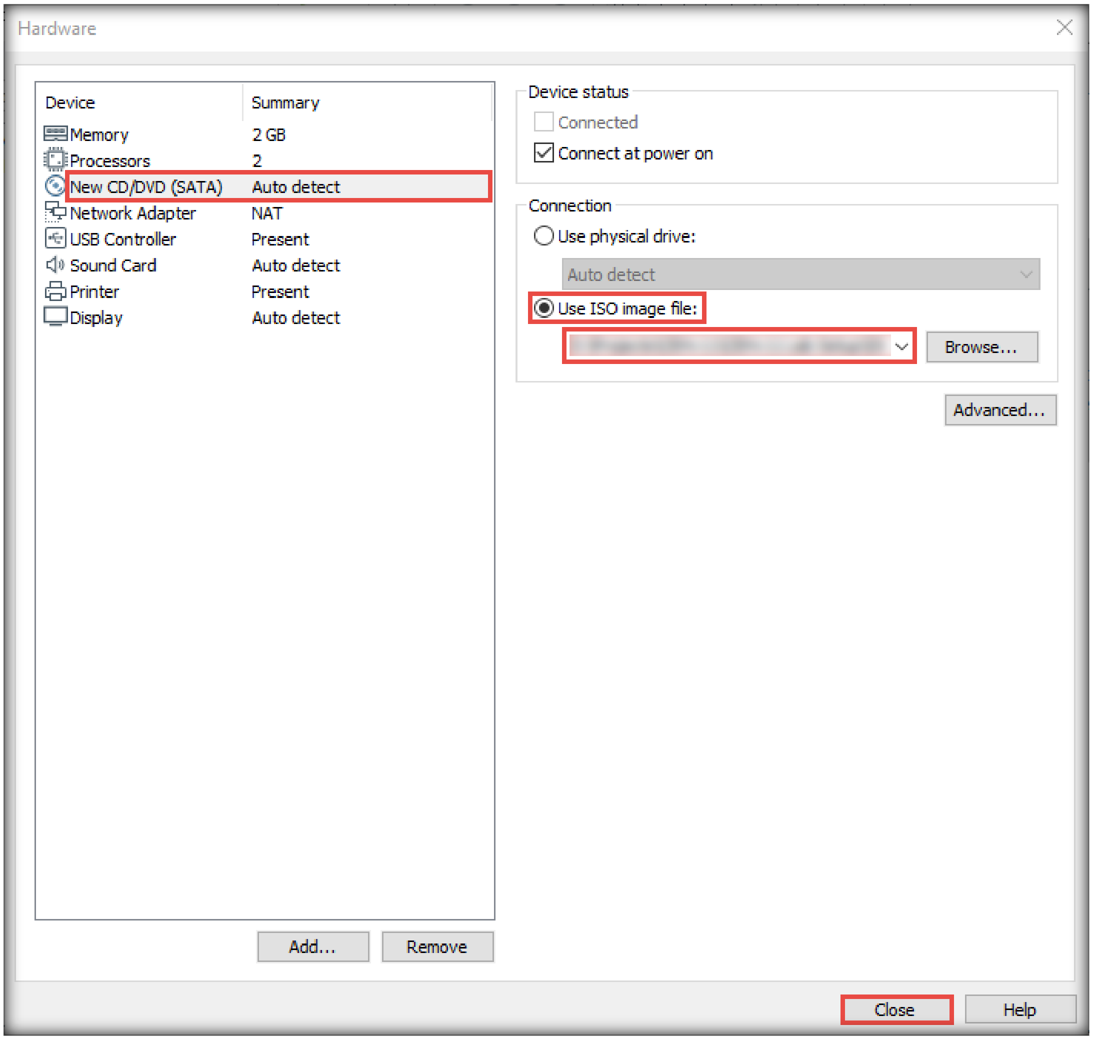
**Ready to Create Virtual Machine**

Click Finish to create the virtual machine. Then you can install Windows Server 2019.

The virtual machine will be created with the following settings:

| | |
|---|---|
| Name: | Windows Server 2019 |
| Location: | \Window... |
| Version: | Workstation 15.x |
| Operating System: | Windows Server 2019 |
| Hard Disk: | 60 GB |
| Memory: | 2048 MB |
| Network Adapter: | NAT |
| Other Devices: | 2 CPU cores, CD/DVD, USB Controller, Printer, Sound... |

8. The **Hardware** window appears; click the **New CD/DVD (SATA)** option from the left-hand pane. In the right-hand pane, select the **Use ISO image file** radio-button, and then click the **Browse...** button to provide the ISO path of Windows Server 2019 ISO file. Click **Close**.



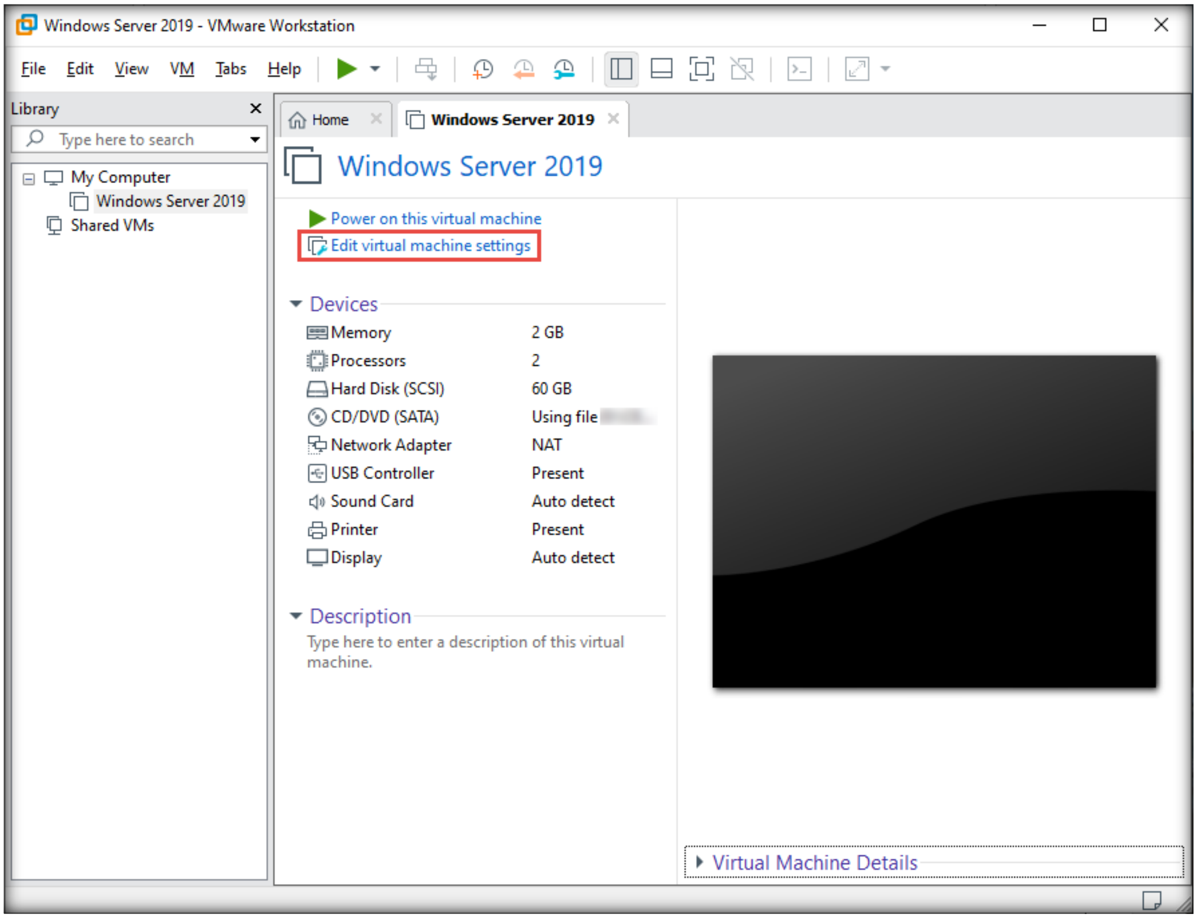
| Device | Summary |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| New CD/DVD (SATA) | Auto detect |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

Device status
☐ Connected
☑ Connect at power on

Connection
○ Use physical drive:
Auto detect
● Use ISO image file:

9. In the **Ready to Create Virtual Machine** wizard, click **Finish**.

10. The **Windows Server 2019** virtual machine appears; click the **Edit virtual machine settings** option.

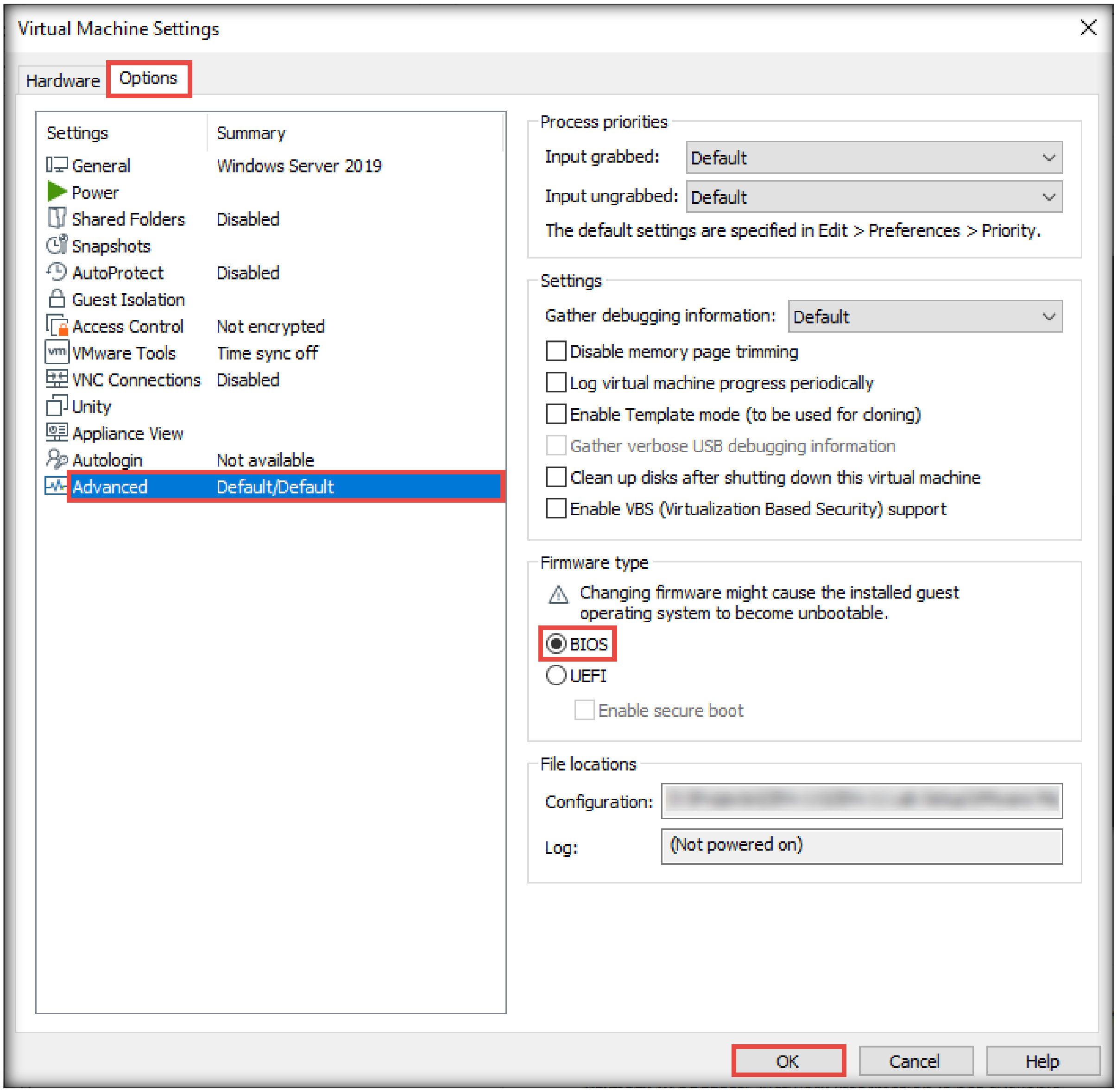


Windows Server 2019 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Windows Server 2019
Shared VMs
Home
Windows Server 2019
Windows Server 2019
Power on this virtual machine
Edit virtual machine settings
Devices

| | |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| Hard Disk (SCSI) | 60 GB |
| CD/DVD (SATA) | Using file |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

Description
Type here to enter a description of this virtual machine.
Virtual Machine Details

11. The **Virtual Machine Settings** window appears; click the **Options** tab.
12. In the **Options** tab; click the **Advanced** option from the left-hand pane.
13. Select the **BIOS** radio-button under the **Firmware type** section in the **Advanced** options, and click **OK**.



| Settings | Summary |
|---|---|
| General | Windows Server 2019 |
| Power | |
| Shared Folders | Disabled |
| Snapshots | |
| AutoProtect | Disabled |
| Guest Isolation | |
| Access Control | Not encrypted |
| VMware Tools | Time sync off |
| VNC Connections | Disabled |
| Unity | |
| Appliance View | |
| Autologin | Not available |
| Advanced | Default/Default |

Process priorities

Input grabbed: Default

Input ungrabbed: Default

The default settings are specified in Edit > Preferences > Priority.

Settings

Gather debugging information: Default

☐ Disable memory page trimming

☐ Log virtual machine progress periodically

☐ Enable Template mode (to be used for cloning)

☐ Gather verbose USB debugging information

☐ Clean up disks after shutting down this virtual machine

☐ Enable VBS (Virtualization Based Security) support

Firmware type

⚠ Changing firmware might cause the installed guest operating system to become unbootable.

● BIOS

○ UEFI

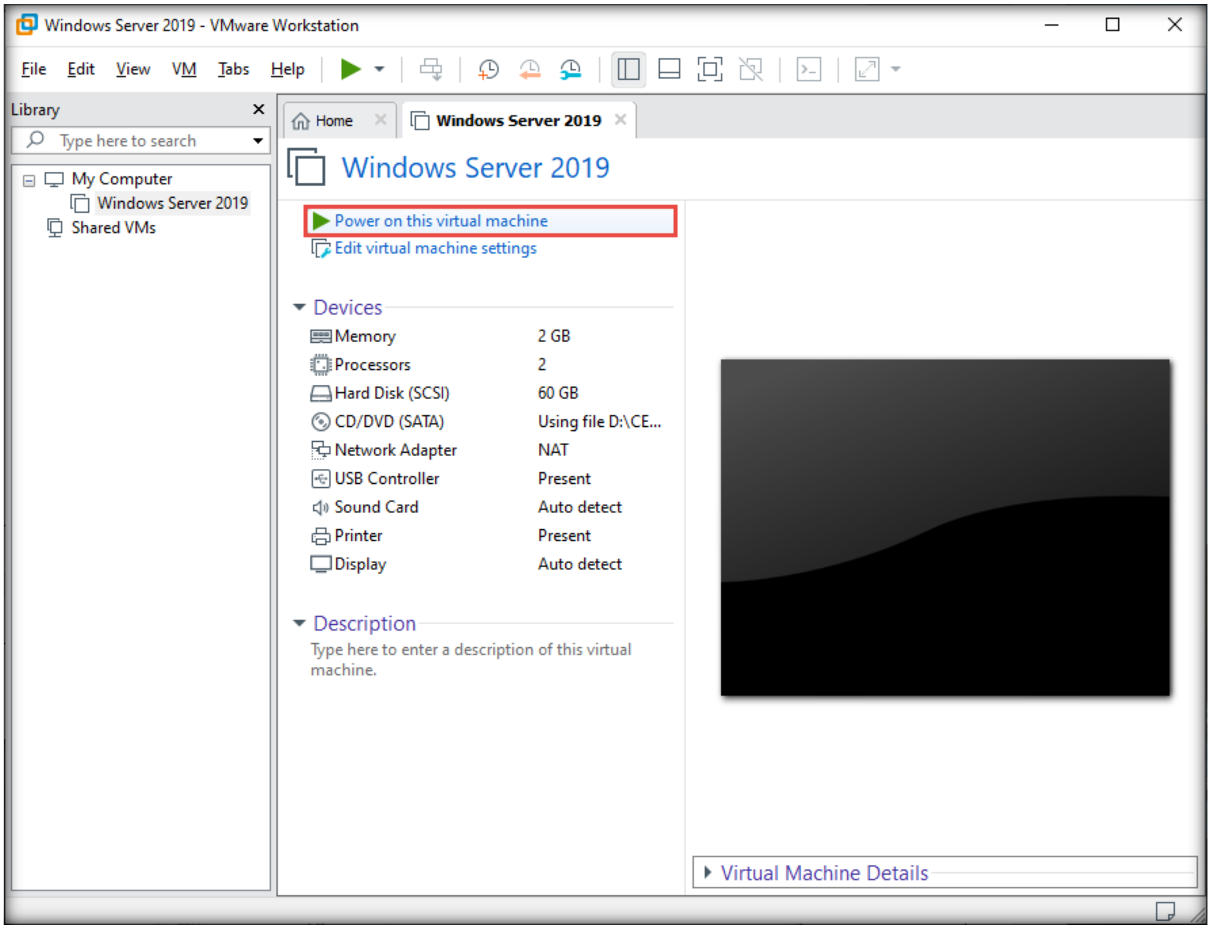
☐ Enable secure boot

File locations

Configuration: [redacted]

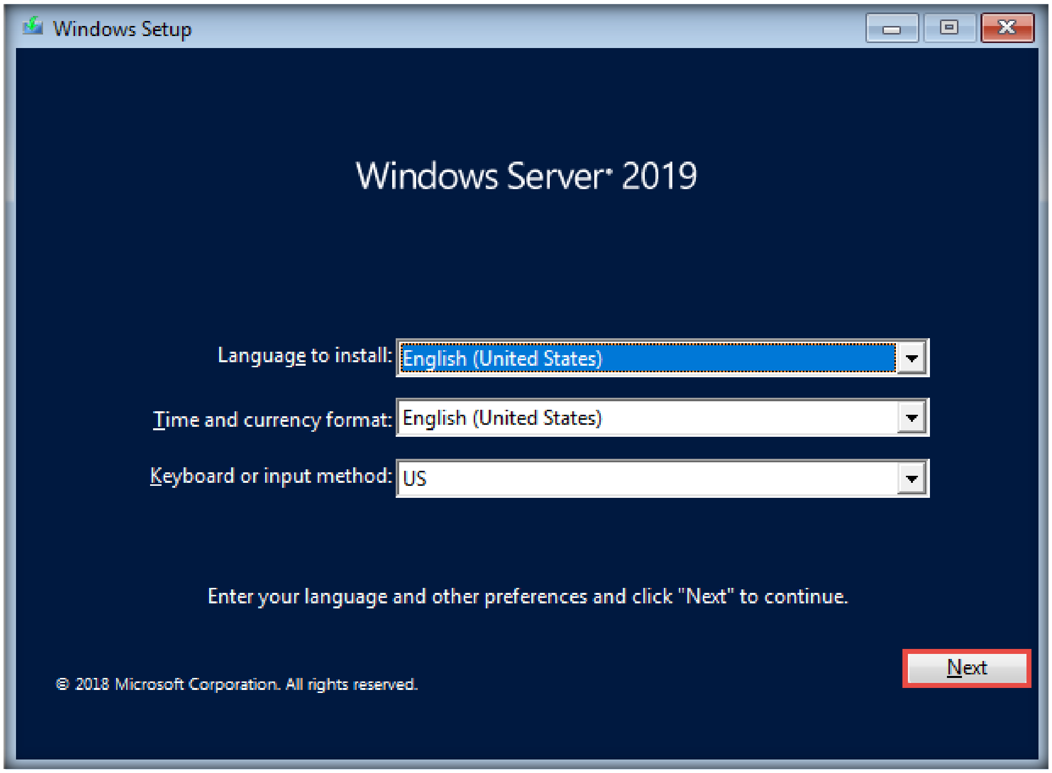
Log: (Not powered on)

14. Now, click the **Power on this virtual machine** option to launch the **Windows Server 2019** virtual machine.


Windows Server 2019 - VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Windows Server 2019
Shared VMs
Home
Windows Server 2019
Windows Server 2019
Power on this virtual machine
Edit virtual machine settings
Devices
Description
Type here to enter a description of this virtual machine.
Virtual Machine Details

| | |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| Hard Disk (SCSI) | 60 GB |
| CD/DVD (SATA) | Using file D:\CE... |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

15. The virtual machine initializes, and the **Windows Setup** window appears. In the first window of the setup, leave the default settings, and click **Next**.


Windows Setup
Windows Server 2019

Language to install: English (United States)

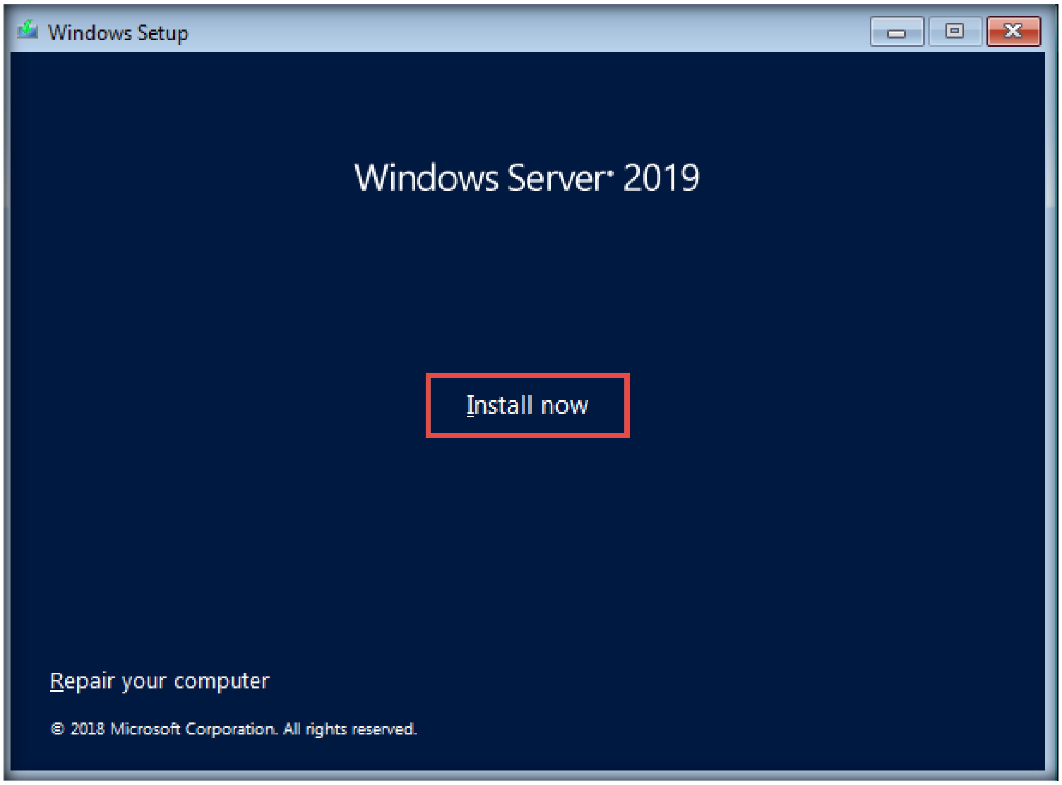
Time and currency format: English (United States)

Keyboard or input method: US

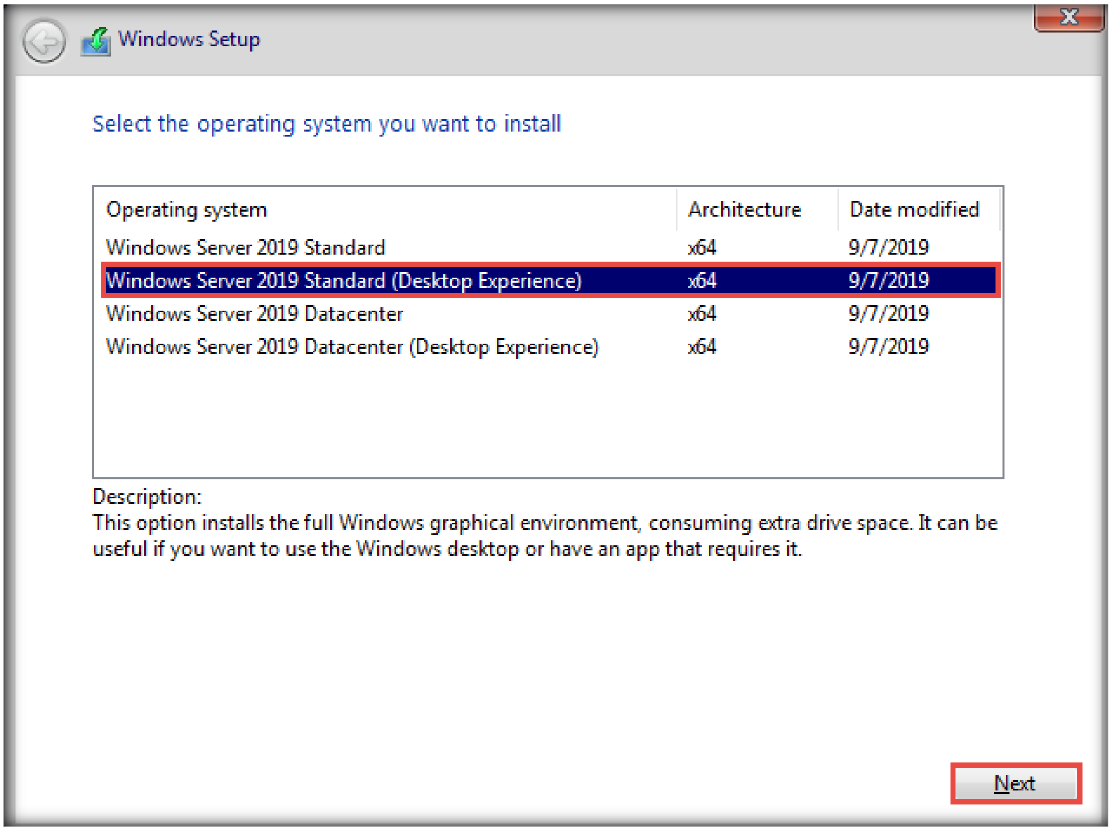
Enter your language and other preferences and click "Next" to continue.

Next
© 2018 Microsoft Corporation. All rights reserved.

16. In the next window, click the **Install now** button to begin the installation.


Windows Setup
Windows Server 2019
Install now
Repair your computer
© 2018 Microsoft Corporation. All rights reserved.

17. In the **Select the operating system you want to install** wizard, select **Windows Server 2019 Standard (Desktop Experience)** and click **Next**.



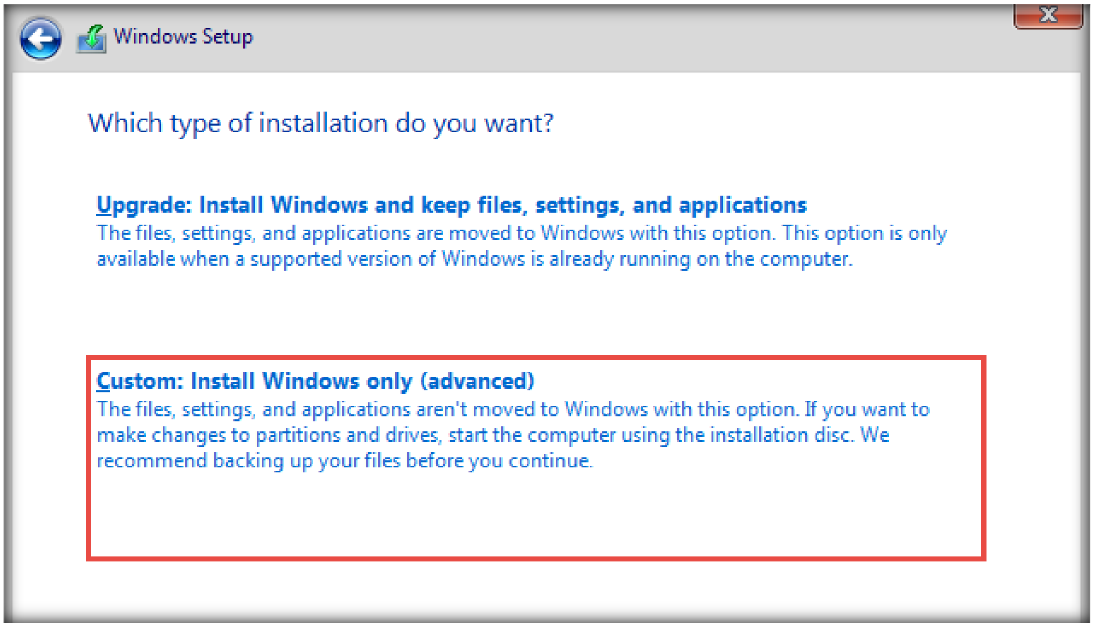
Select the operating system you want to install

| Operating system | Architecture | Date modified |
|---|---|---|
| Windows Server 2019 Standard | x64 | 9/7/2019 |
| Windows Server 2019 Standard (Desktop Experience) | x64 | 9/7/2019 |
| Windows Server 2019 Datacenter | x64 | 9/7/2019 |
| Windows Server 2019 Datacenter (Desktop Experience) | x64 | 9/7/2019 |

Description:
This option installs the full Windows graphical environment, consuming extra drive space. It can be useful if you want to use the Windows desktop or have an app that requires it.

18. In the **Applicable notices and license terms** wizard, check the **I accept the license terms** checkbox and click **Next** to proceed.

19. In the **Which type of installation do you want?** wizard, click the **Custom: Install Windows only (advanced)** option.



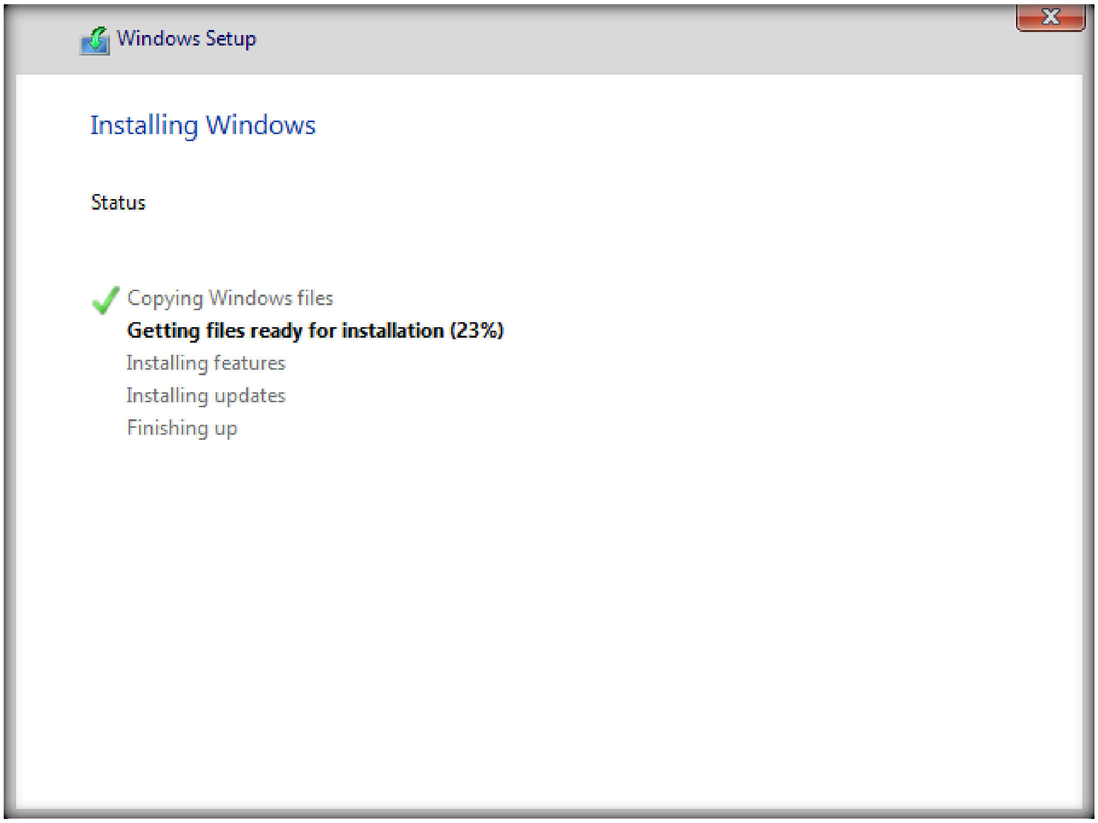
Which type of installation do you want?

**Upgrade: Install Windows and keep files, settings, and applications**
The files, settings, and applications are moved to Windows with this option. This option is only available when a supported version of Windows is already running on the computer.

**Custom: Install Windows only (advanced)**
The files, settings, and applications aren't moved to Windows with this option. If you want to make changes to partitions and drives, start the computer using the installation disc. We recommend backing up your files before you continue.

20. In the **Where do you want to install Windows?** wizard, click **Next**.

21. The installation of the Windows Server 2019 operating system begins. The machine will restart once the installation has completed.

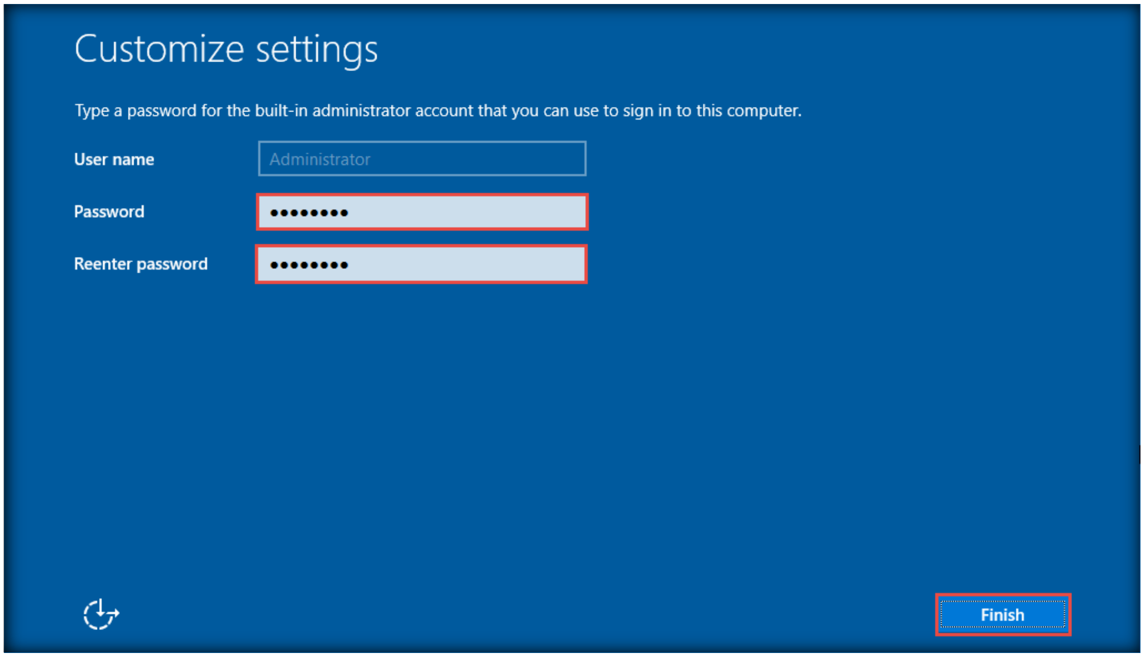


Installing Windows

Status

✓ Copying Windows files
**Getting files ready for installation (23%)**
Installing features
Installing updates
Finishing up

22. After completing the installation, the system restarts.
23. Once the system reboots, the **Customize settings** wizard appears; leave the default **User name** as **Administrator**. Type **Pa$$w0rd** in the **Password** and **Reenter password** fields. Click **Finish**.



Customize settings

Type a password for the built-in administrator account that you can use to sign in to this computer.

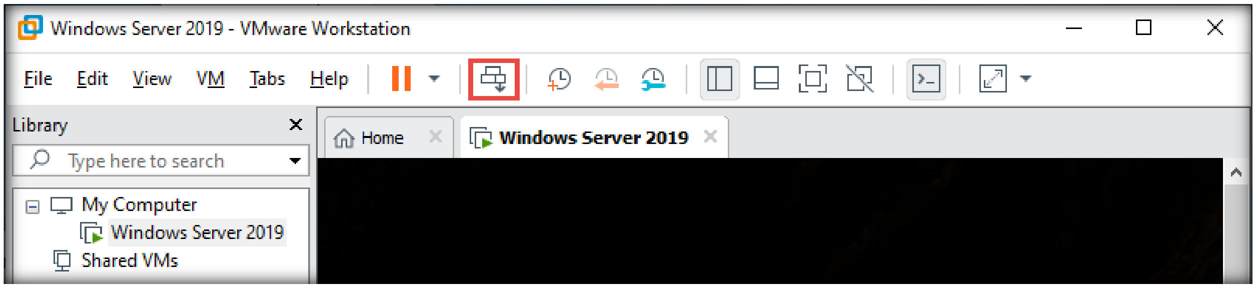
User name: Administrator

Password: ••••••••

Reenter password: ••••••••



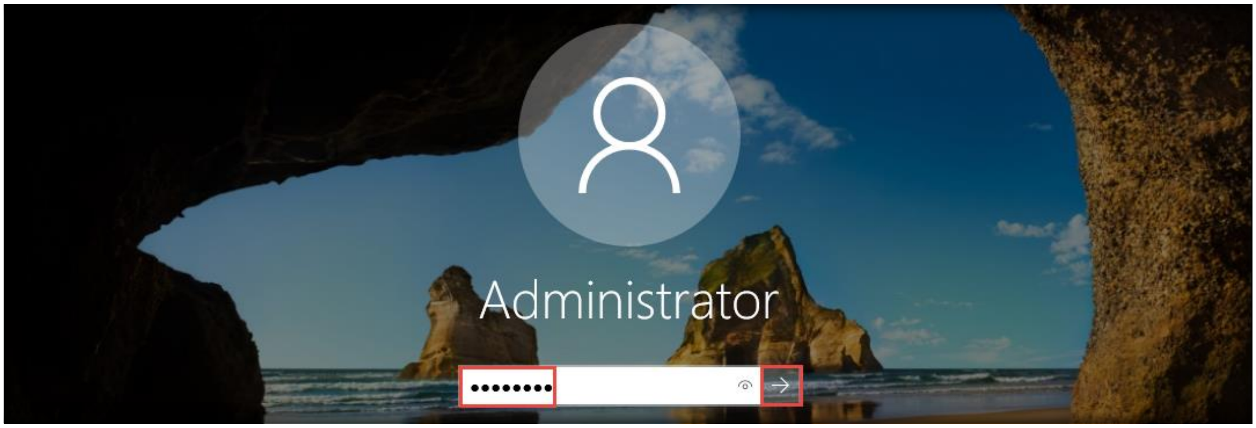
24. The machine starts, and the lock screen appears; click the **Send Ctrl+Alt+Del to this virtual machine** icon ( ) from the menu bar.



Windows Server 2019 - VMware Workstation

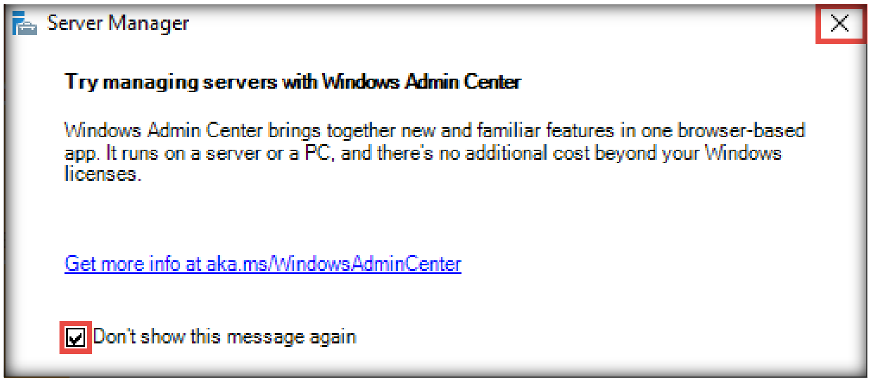
File
Edit
View
VM
Tabs
Help
Library
Type here to search
Home
Windows Server 2019
My Computer
Windows Server 2019
Shared VMs

25. Log in to the **Administrator** account by typing **Pa$$w0rd** as the password and pressing **Enter**.



Administrator
••••••••

26. The **Networks** notification appears in the right-hand pane; click **Yes**.
27. The **Server Manager** window also appears along with the **Server Manager** pop-up window. Select the **Don't show this message again** checkbox and close both the **Server Manager** pop-up and **Server Manager** windows.



Server Manager

Try managing servers with Windows Admin Center

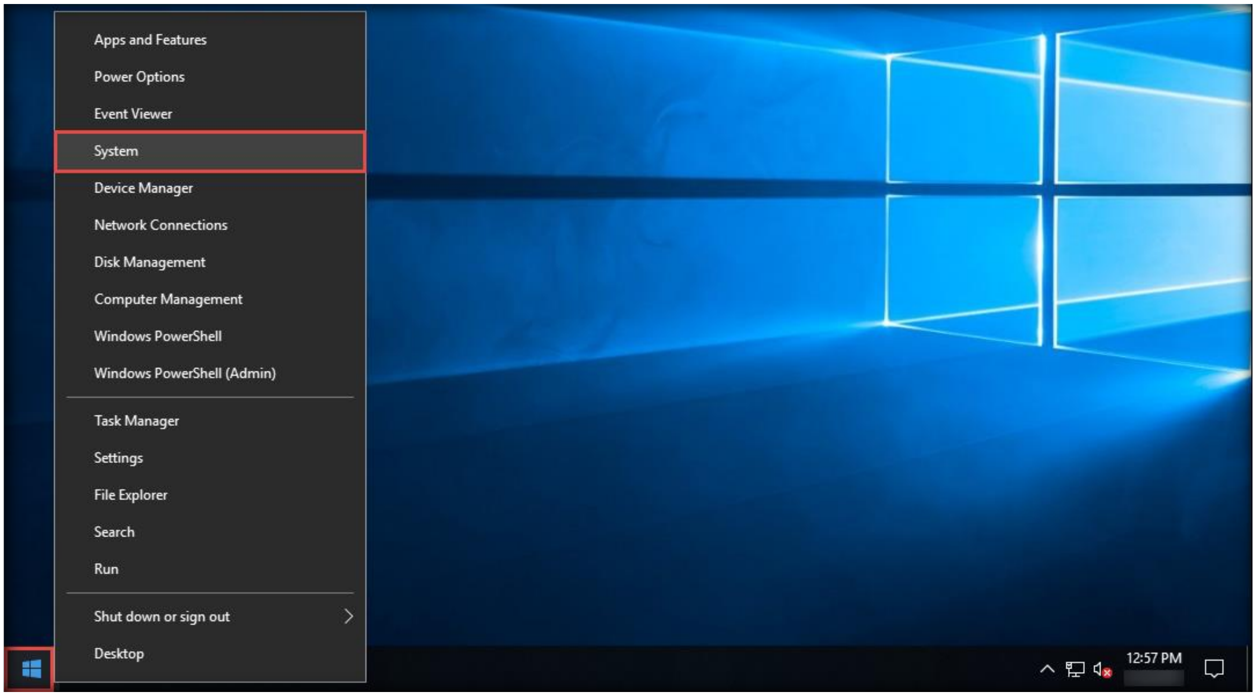
Windows Admin Center brings together new and familiar features in one browser-based app. It runs on a server or a PC, and there's no additional cost beyond your Windows licenses.

Get more info at aka.ms/WindowsAdminCenter

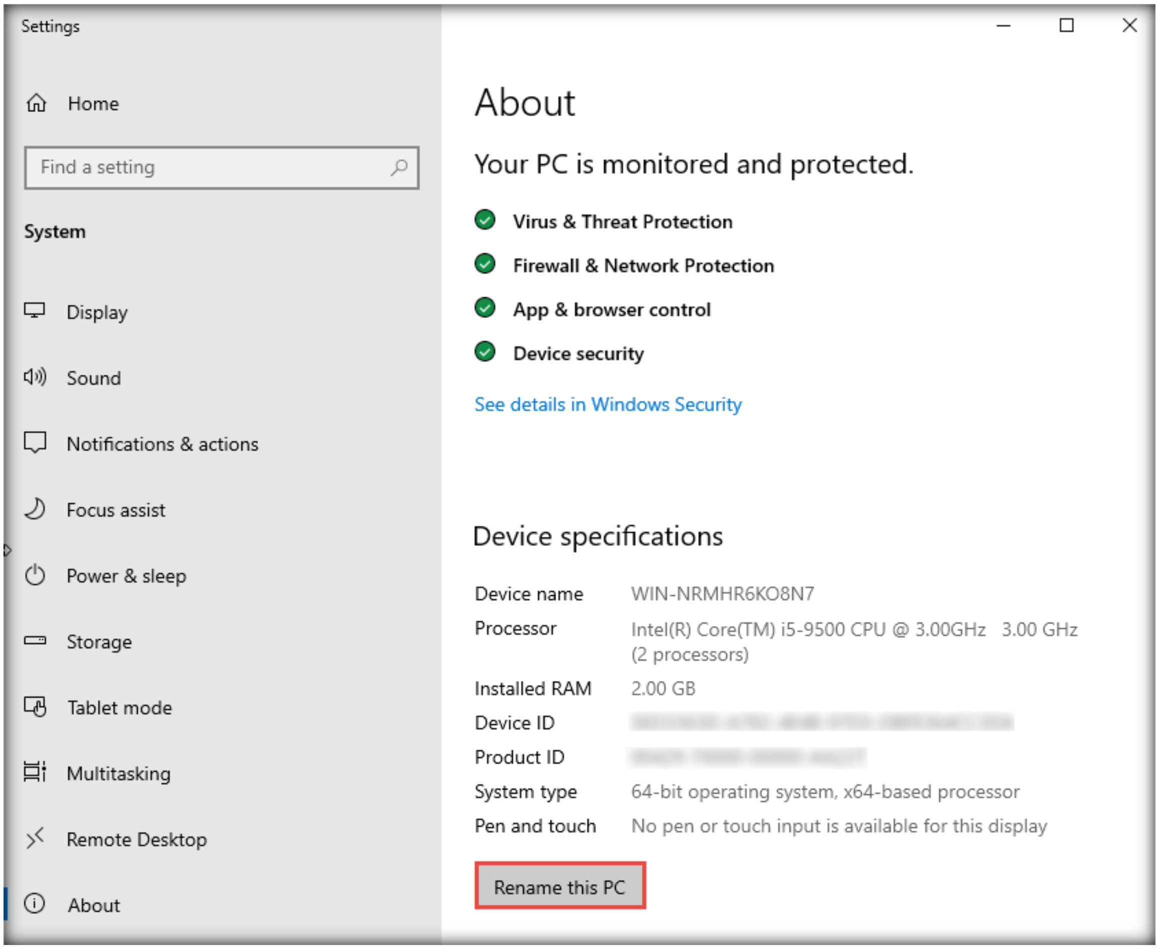
☑ Don't show this message again

**Note**: If **VMware Tools Setup** wizard appears, wait for the installation to complete. After the installation has completed, if a prompt appears to restart the machine, click **Yes**. Log in to the **Administrator** account by typing **Pa$$w0rd** as the password and pressing **Enter**.

28. Right-click the **Start** button in the bottom-left corner of the **Desktop** and click **System** from the context menu.


Apps and Features
Power Options
Event Viewer
System
Device Manager
Network Connections
Disk Management
Computer Management
Windows PowerShell
Windows PowerShell (Admin)
Task Manager
Settings
File Explorer
Search
Run
Shut down or sign out
Desktop
12:57 PM

29. The **Settings** window appears; click **Rename this PC**.


Settings
Home
Find a setting
System
Display
Sound
Notifications & actions
Focus assist
Power & sleep
Storage
Tablet mode
Multitasking
Remote Desktop
About

About

Your PC is monitored and protected.

- Virus & Threat Protection
- Firewall & Network Protection
- App & browser control
- Device security

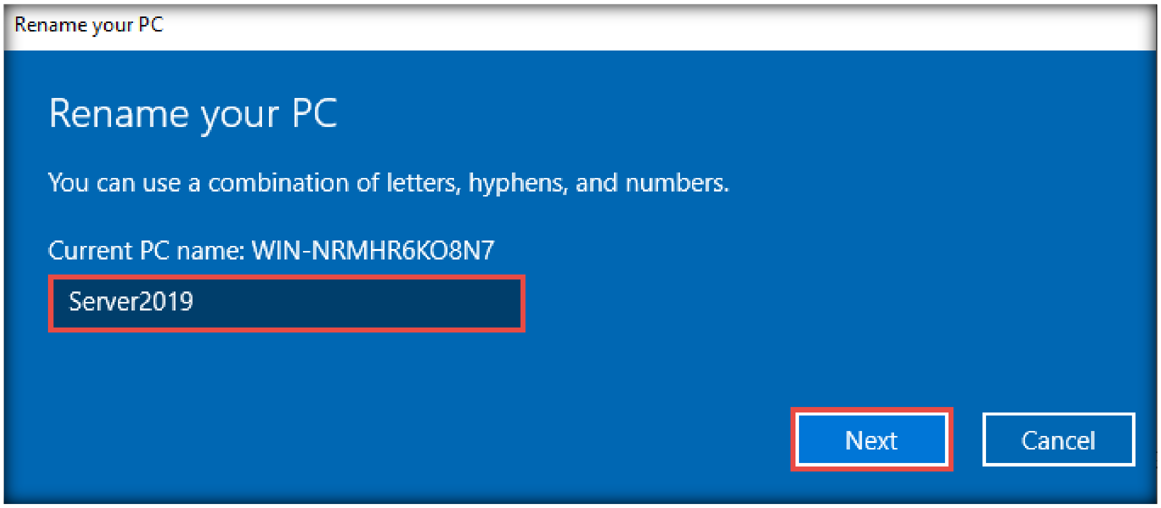
See details in Windows Security

Device specifications

| | |
|---|---|
| Device name | WIN-NRMHR6KO8N7 |
| Processor | Intel(R) Core(TM) i5-9500 CPU @ 3.00GHz 3.00 GHz (2 processors) |
| Installed RAM | 2.00 GB |
| Device ID | |
| Product ID | |
| System type | 64-bit operating system, x64-based processor |
| Pen and touch | No pen or touch input is available for this display |

Rename this PC

30. The **Rename your PC** pop-up window appears; type **Server2019** in the box and click **Next**.


Rename your PC

Rename your PC

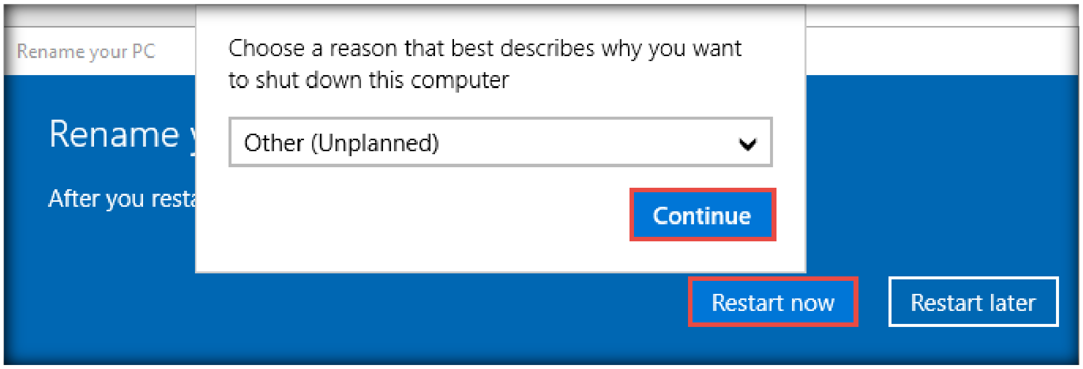
You can use a combination of letters, hyphens, and numbers.

Current PC name: WIN-NRMHR6KO8N7

Server2019

Next
Cancel

31. After the renaming process, click the **Restart now** and, then, **Continue** buttons to apply the changes.

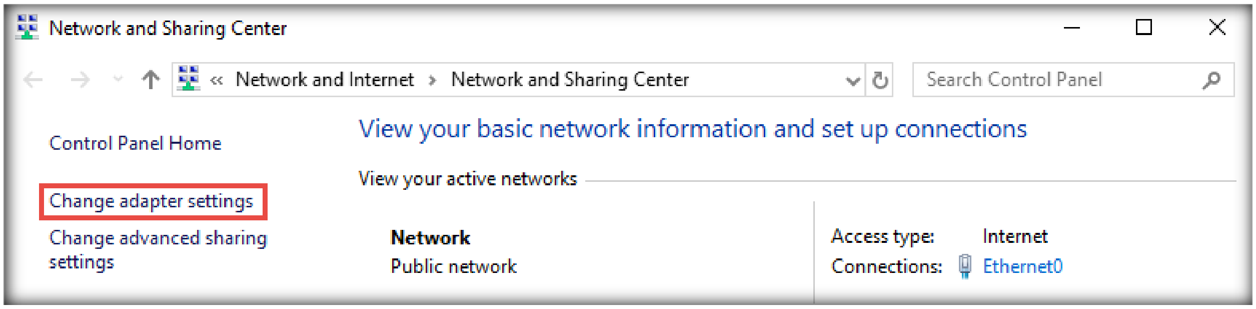


Choose a reason that best describes why you want to shut down this computer

Other (Unplanned)

Rename your PC
Rename y
After you resta
Continue
Restart now
Restart later

32. After the virtual machine restarts, log in to virtual machine with the credentials **Administrator** and **Pa$$w0rd** and close the **Server Manager** window. Open the **Network and Sharing Center** and click the **Change adapter settings** link from the left pane.



View your basic network information and set up connections

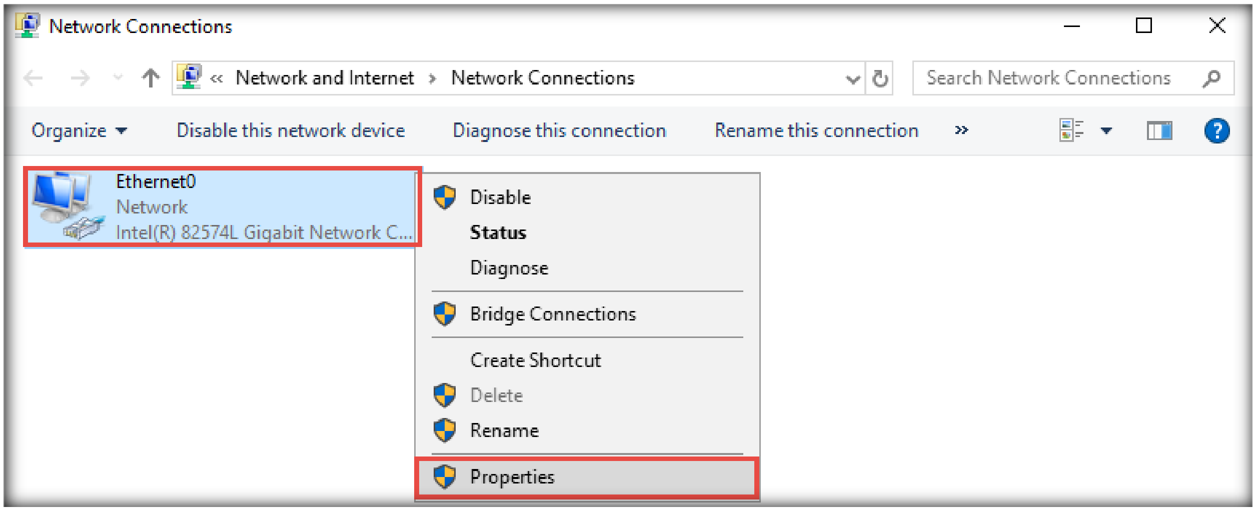
View your active networks

Network
Public network

Access type: Internet
Connections: Ethernet0

Network and Sharing Center
« Network and Internet › Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings

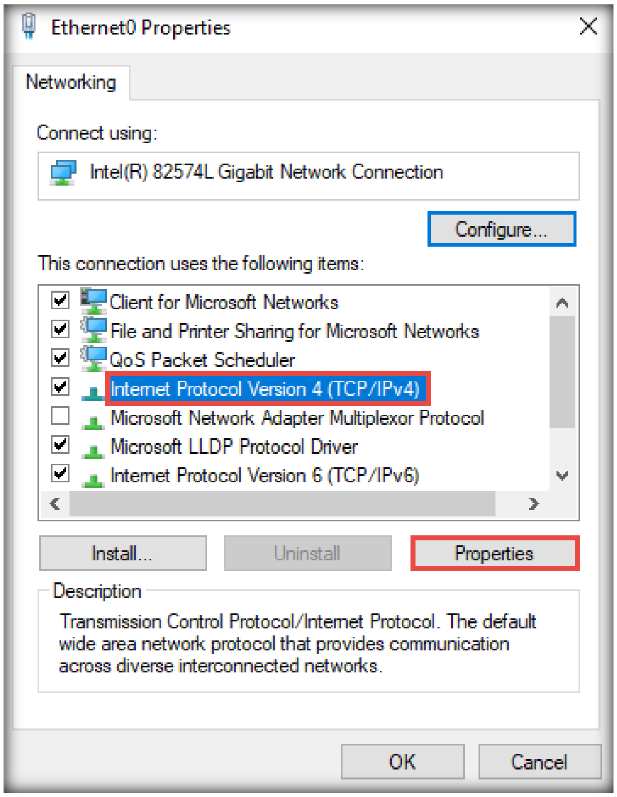
33. The **Network Connections** window appears. Right-click the network interface (here, **Ethernet0**) and click **Properties**.



Ethernet0
Network
Intel(R) 82574L Gigabit Network C...

Network Connections
« Network and Internet › Network Connections
Search Network Connections
Organize ▾
Disable this network device
Diagnose this connection
Rename this connection
»
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties

34. The **Ethernet0 Properties** window appears; scroll down the list, select **Internet Protocol Version 4 (TCP/IPv4)**, and click on **Properties**.



Ethernet0 Properties

Networking

Connect using:

Intel(R) 82574L Gigabit Network Connection

This connection uses the following items:

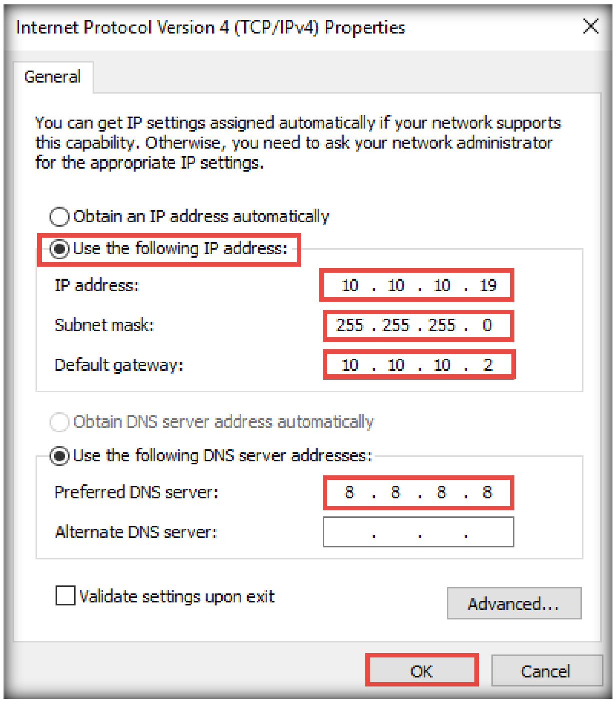
☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☑ Internet Protocol Version 4 (TCP/IPv4)
☐ Microsoft Network Adapter Multiplexor Protocol
☑ Microsoft LLDP Protocol Driver
☑ Internet Protocol Version 6 (TCP/IPv6)

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

35. Select the **Use the following IP address** radio button. Assign **10.10.10.19** as the **IP address**, **255.255.255.0** as the **Subnet mask**, and **10.10.10.2** as the **Default gateway**.

36. Assign **8.8.8.8** as the **Preferred DNS server** address and click **OK**.



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically
● Use the following IP address:

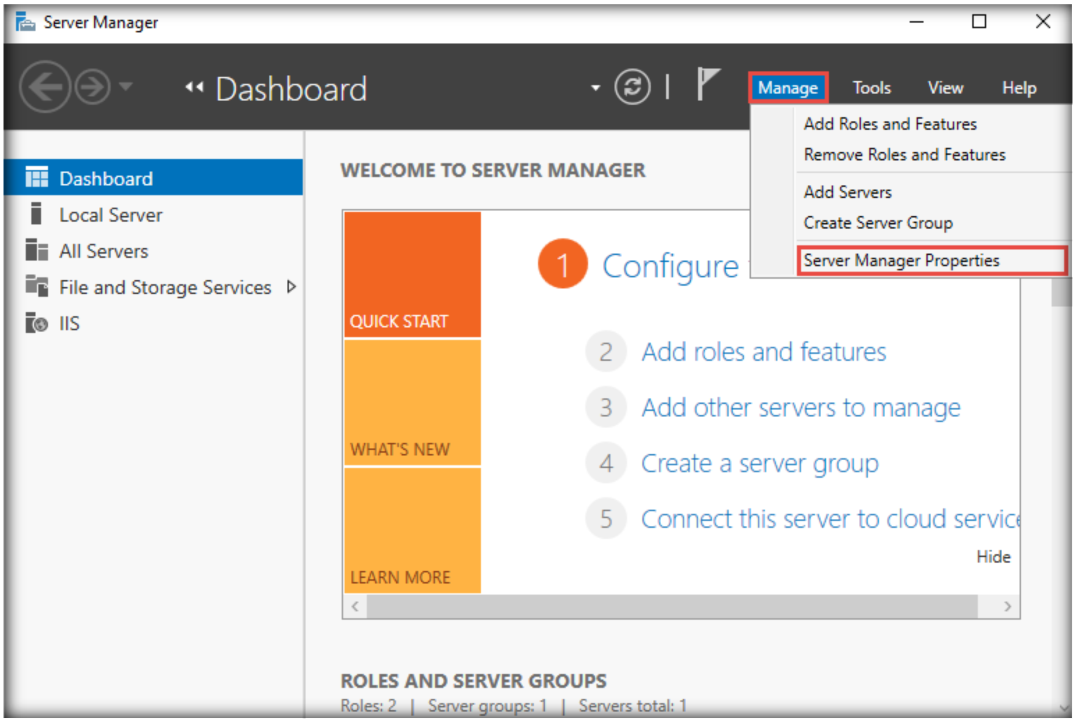
IP address: 10 . 10 . 10 . 19
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 10 . 10 . 10 . 2

○ Obtain DNS server address automatically
● Use the following DNS server addresses:

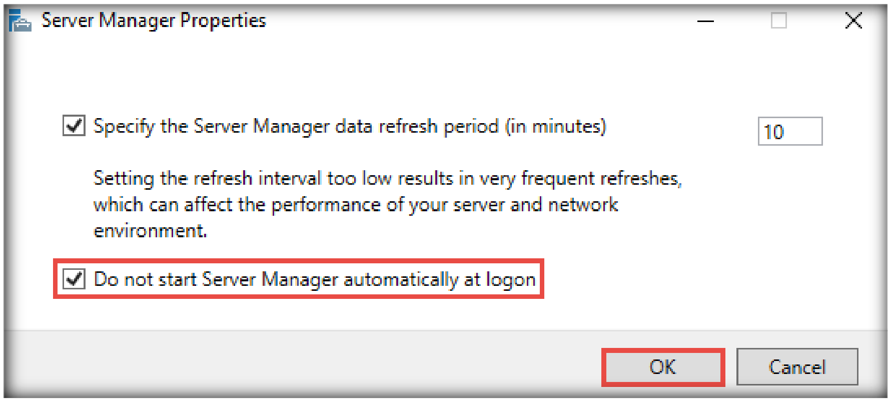
Preferred DNS server: 8 . 8 . 8 . 8
Alternate DNS server: . . .

☐ Validate settings upon exit

37. **Close** the **Ethernet0 Properties** window; then, close all open windows.
38. Click on the **Start** icon present in the bottom-left corner of the **Desktop**. Click **Server Manager** from the available applications.
39. In the **Server Manager** window, navigate to **Manage** → **Server Manager Properties**.


Server Manager
Dashboard
Manage
Tools
View
Help
Add Roles and Features
Remove Roles and Features
Add Servers
Create Server Group
Server Manager Properties
Dashboard
Local Server
All Servers
File and Storage Services
IIS
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud servic
Hide
ROLES AND SERVER GROUPS
Roles: 2 | Server groups: 1 | Servers total: 1

40. The **Server Manager Properties** window appears, check the **Do not start Server Manager automatically at logon** option and click **OK**.


Server Manager Properties

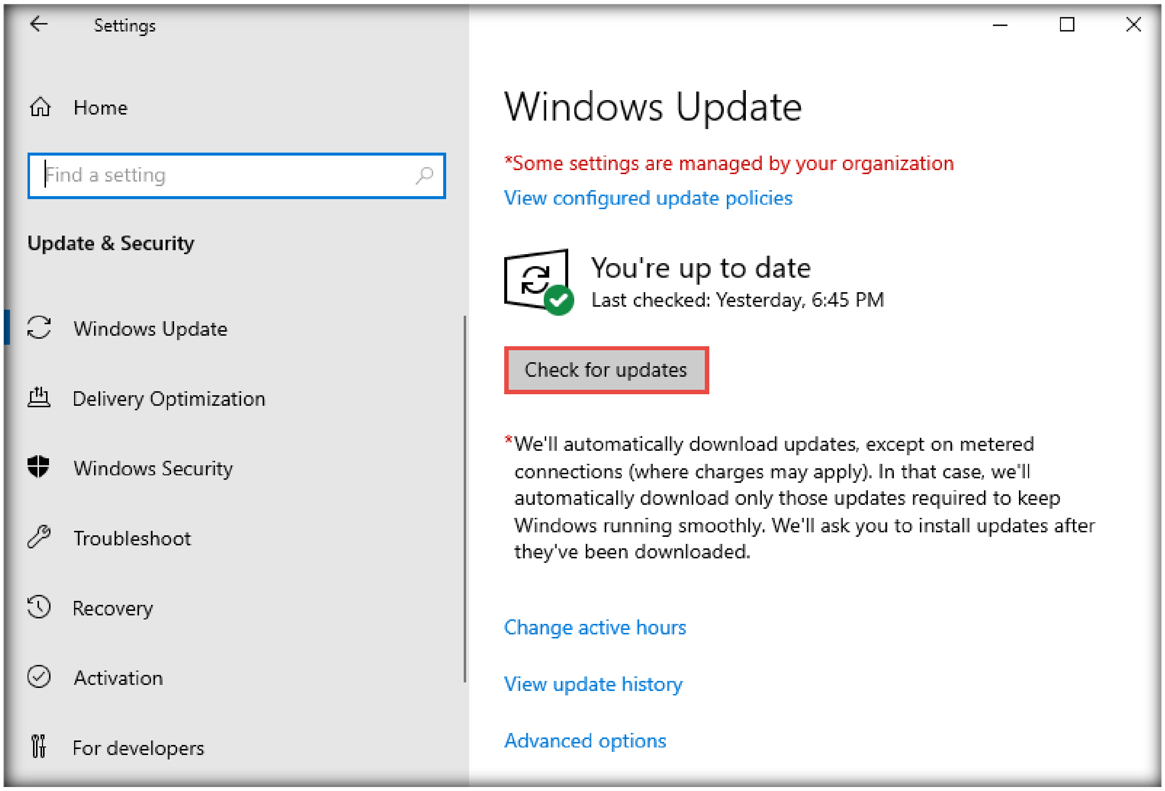
☑ Specify the Server Manager data refresh period (in minutes) 10

Setting the refresh interval too low results in very frequent refreshes, which can affect the performance of your server and network environment.

☑ Do not start Server Manager automatically at logon

41. Close the **Server Manager** window.

42. Right-click the **Windows** button in the lower-left corner of the screen and click **Settings**.
43. In the **Settings** window, click **Update & Security**.
44. Click **Check for updates** from the right-hand pane.


Settings
Home
Find a setting
Update & Security
Windows Update
Delivery Optimization
Windows Security
Troubleshoot
Recovery
Activation
For developers
Check for updates
View configured update policies
Change active hours
View update history
Advanced options

Windows Update

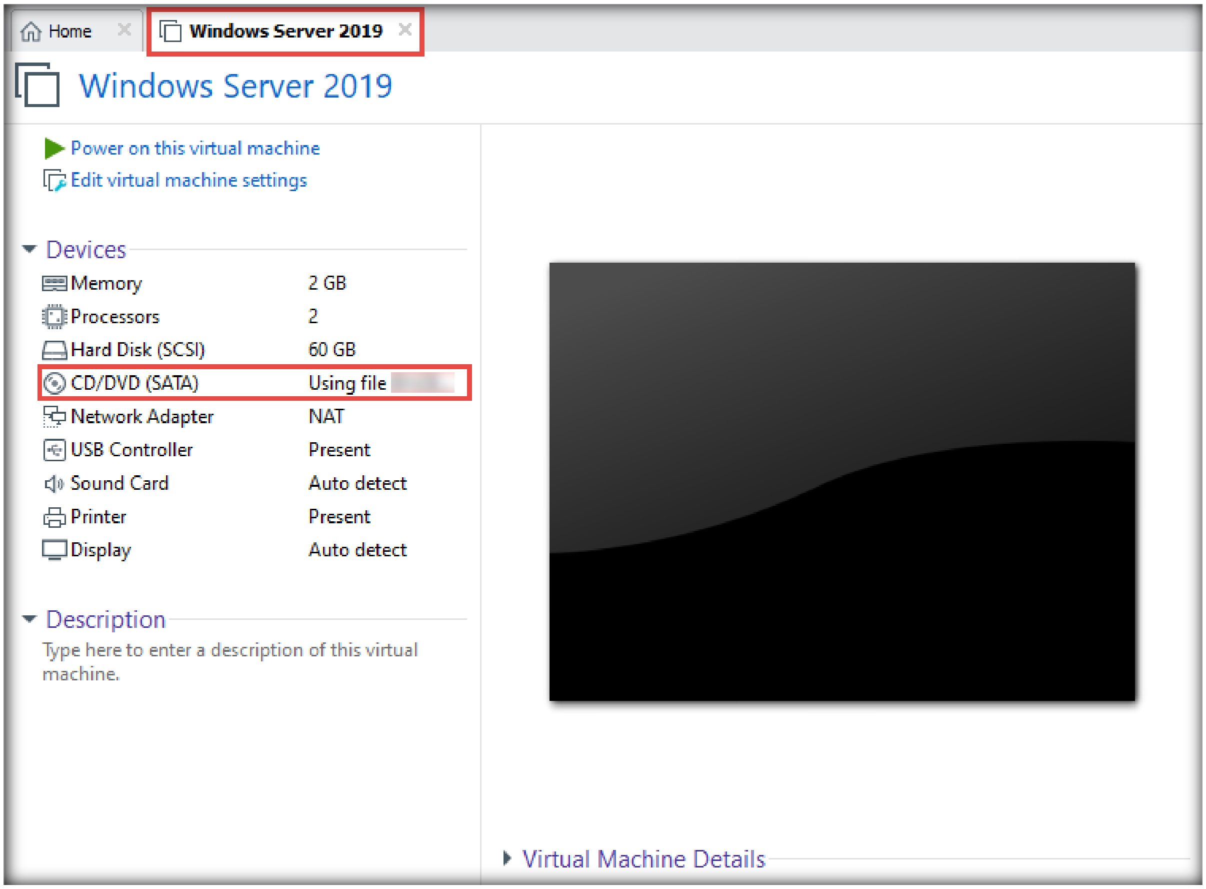
*Some settings are managed by your organization

You're up to date
Last checked: Yesterday, 6:45 PM

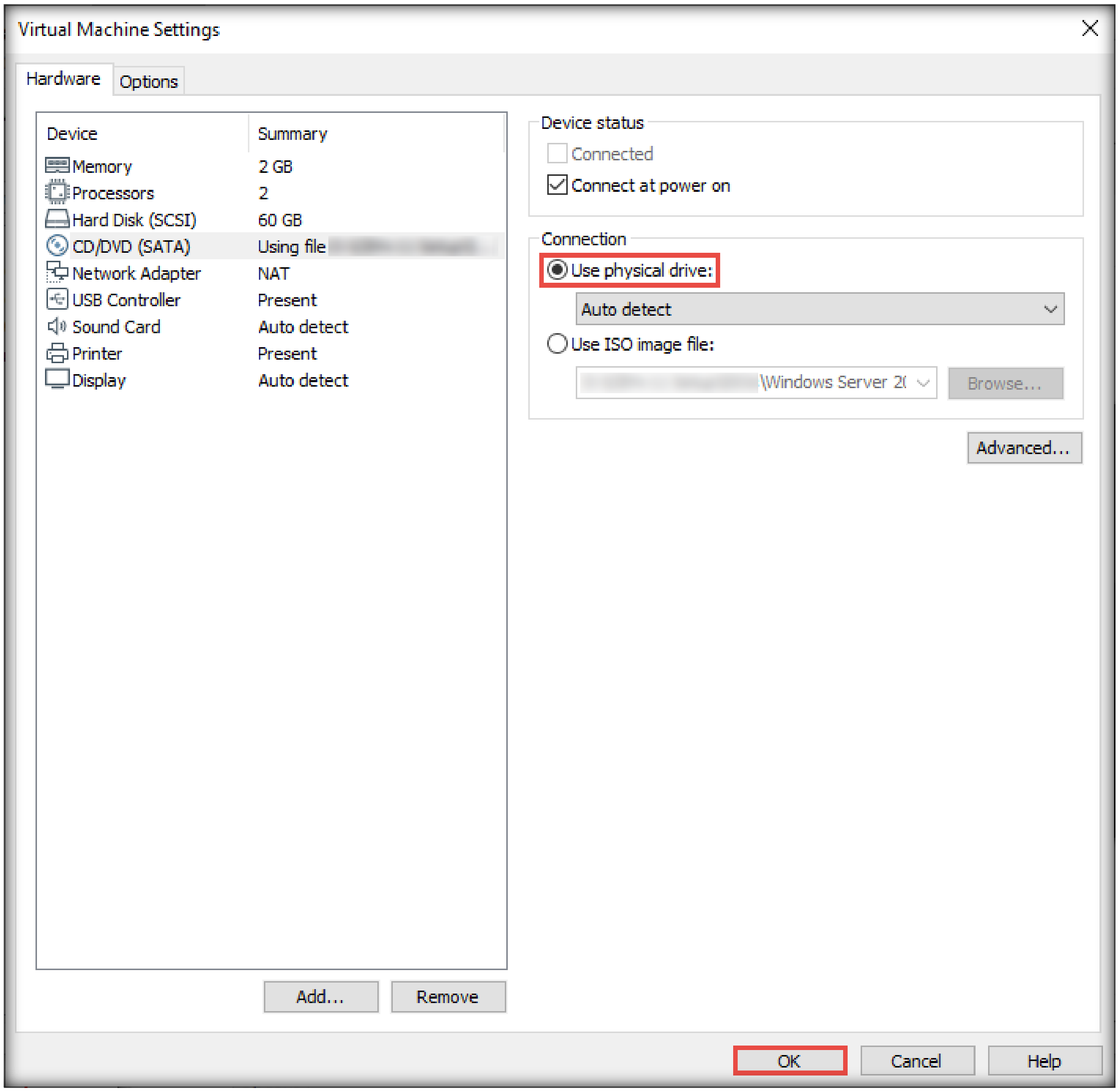
*We'll automatically download updates, except on metered connections (where charges may apply). In that case, we'll automatically download only those updates required to keep Windows running smoothly. We'll ask you to install updates after they've been downloaded.

45. Check for and install the latest updates.
46. After installing all the updates, restart the machine.

47. Turn off the virtual machine. In the **Devices** section of the **Windows Server 2019** tab, click **CD\DVD (SATA)** under the devices section.


Home
Windows Server 2019
Windows Server 2019
Power on this virtual machine
Edit virtual machine settings
Devices
Memory 2 GB
Processors 2
Hard Disk (SCSI) 60 GB
CD/DVD (SATA) Using file
Network Adapter NAT
USB Controller Present
Sound Card Auto detect
Printer Present
Display Auto detect
Description
Type here to enter a description of this virtual machine.
Virtual Machine Details

48. The **Virtual Machine Settings** window appears; choose the **Use physical drive:** radio button under **Connection** section and click **OK**.



Virtual Machine Settings

| Device | Summary |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| Hard Disk (SCSI) | 60 GB |
| CD/DVD (SATA) | Using file [redacted] |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

Device status

☐ Connected

☑ Connect at power on

Connection

● Use physical drive:

Auto detect

○ Use ISO image file:

[redacted] \Windows Server 2(

## Install the Windows Server 2016 Virtual Machine

49. Similarly, create and install the **Windows Server 2016 Standard** virtual machine with the default hard disk space of **60 GB** and **2048 MB** of **RAM memory**. Include the below changes:
    - Virtual machine name: **Windows Server 2016**
    - Full name: **Administrator**
    - Password: **Pa$$w0rd**
    - Machine Name: **Server2016**

    **Note**: To change the Machine Name:

    - Right-click the **Start** button in the bottom-left corner and click **System** from the context menu.

    - The **System** window appears; click **Change settings**.
    - The **System Properties** window appears; click **Change...**
    - Type the computer name (here, **Server2016**) and click **OK**.
    - The **You must restart your computer to apply these changes** pop-up appears; click **OK**.
  - Network Settings:
    - IP Address: **10.10.10.16**
    - Subnet mask: **255.255.255.0**
    - Default gateway: **10.10.10.2**
    - Preferred DNS server: **8.8.8.8**
  - Disable the **Server Manager** on startup on **Windows Server 2016**.
  - Check for and install the latest updates; to do so follow below steps:
    - Click the **Search Windows** icon (🔍) at the bottom of the **Desktop** window; type **Settings**. Click **Settings** from the search results.
    - In the **Settings** window, click the **Update & security** option and click on **Check for update** from the right-hand pane.

## Install the Windows 10 Virtual Machine

50. Similarly, create and install the **Windows 10 Enterprise**/**Professional** virtual machine with a hard disk space **100 GB** and **2048 MB** of **RAM memory**. Include the below changes:
    - In the **Select a Guest Operating System** wizard, select the **Version** as **Windows 10 x64**.
    - Virtual machine name: **Windows 10**
    - In the **Get going fast** wizard, click **Use Express settings** button.
    - In the **Choose how you'll connect** wizard, select the **Join a local Active Directory domain** option.
    - Full name: **Admin**
    - Password: **Pa$$w0rd**

      **Note**: If a **Networks** pop-up window appears in the right side of the window, click the **Yes** button.
    - Machine Name: **Windows10**

      **Note**: To change the Machine Name:
      - Right-click the **Start** button in the bottom-left corner and click **System** from the context menu.
      - The **Settings** window appears; click **System info**.

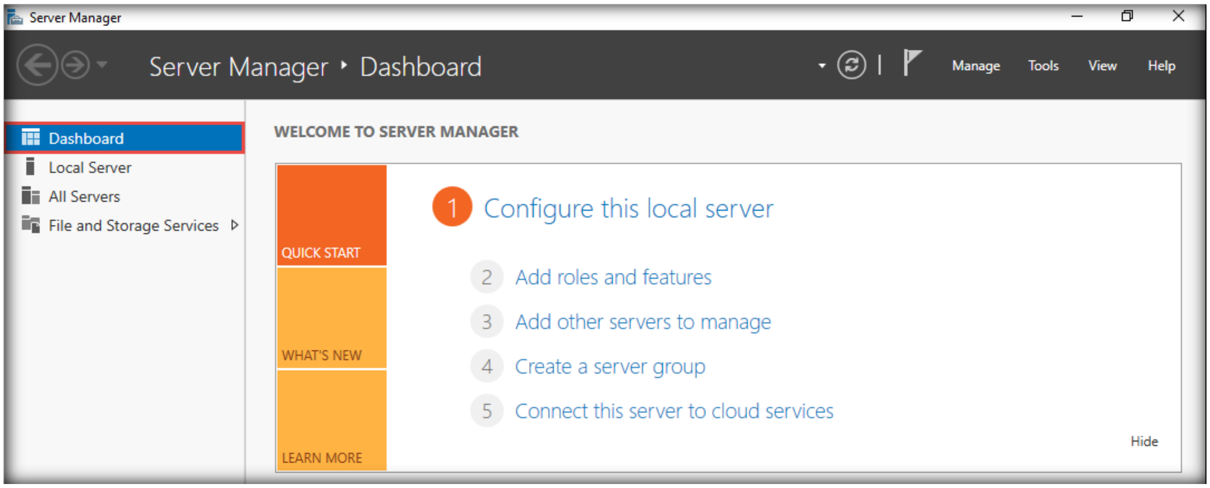
    - The **System** window appears; click **Change settings**.
    - The **System Properties** window appears; click **Change...**
    - Type the computer name (here, **Windows10**) and click **OK**.
    - The **You must restart your computer to apply these changes** pop-up appears; click **OK**.
- Network Settings:
    - IP address: **10.10.10.10**
    - Subnet mask: **255.255.255.0**
    - Default gateway: **10.10.10.2**
    - Preferred DNS server: **8.8.8.8**
- Check for and install the latest updates.

[Back to Configuration Task Outline]

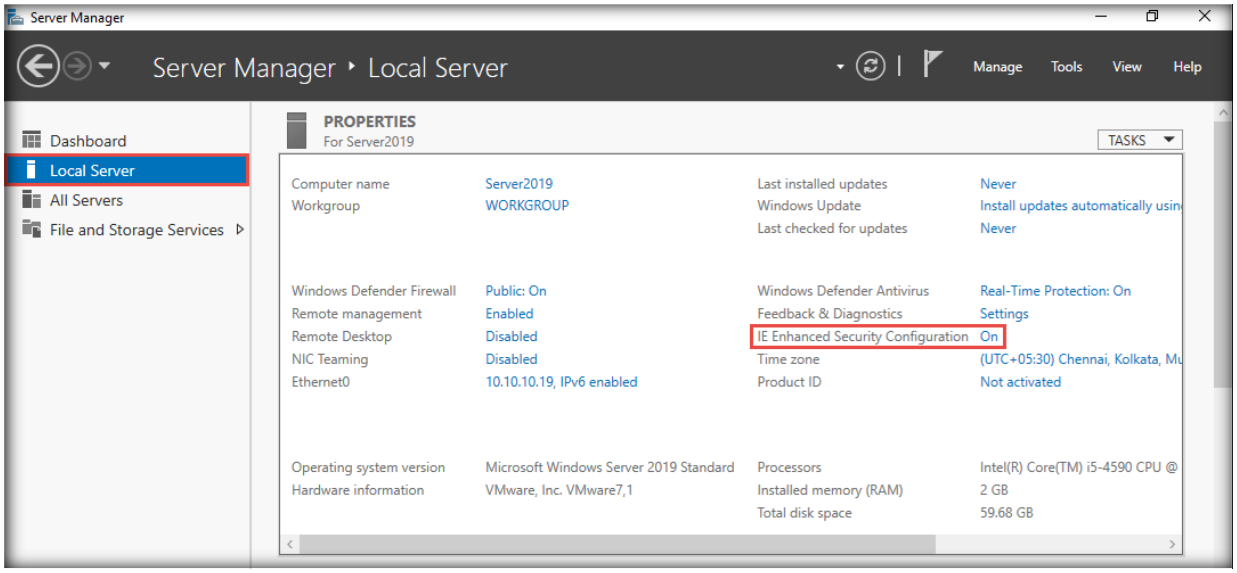
# CT#8: Configure the Internet Explorer (IE) Enhanced Security Configuration in the Windows Server 2019 and Windows Server 2016 Virtual Machines

## Configure IE Enhanced Security in the Windows Server 2019 Virtual Machine

1. Log in to the **Windows Server 2019** virtual machine using the credentials **Administrator** and **Pa$$w0rd**.
2. If a **Shutdown Event Tracker** pop-up appears, click **Cancel**.
3. To configure the **Internet Explorer Enhanced Security Configuration**, go to the **Start** menu → **Server Manager** application.
4. The **Server Manager** main window appears. By default, the **Dashboard** will be selected.


Server Manager
Server Manager ‣ Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
Hide

5. Select **Local Server** in the left pane of the window. In the right pane, click **On** for **IE Enhanced Security Configuration**.

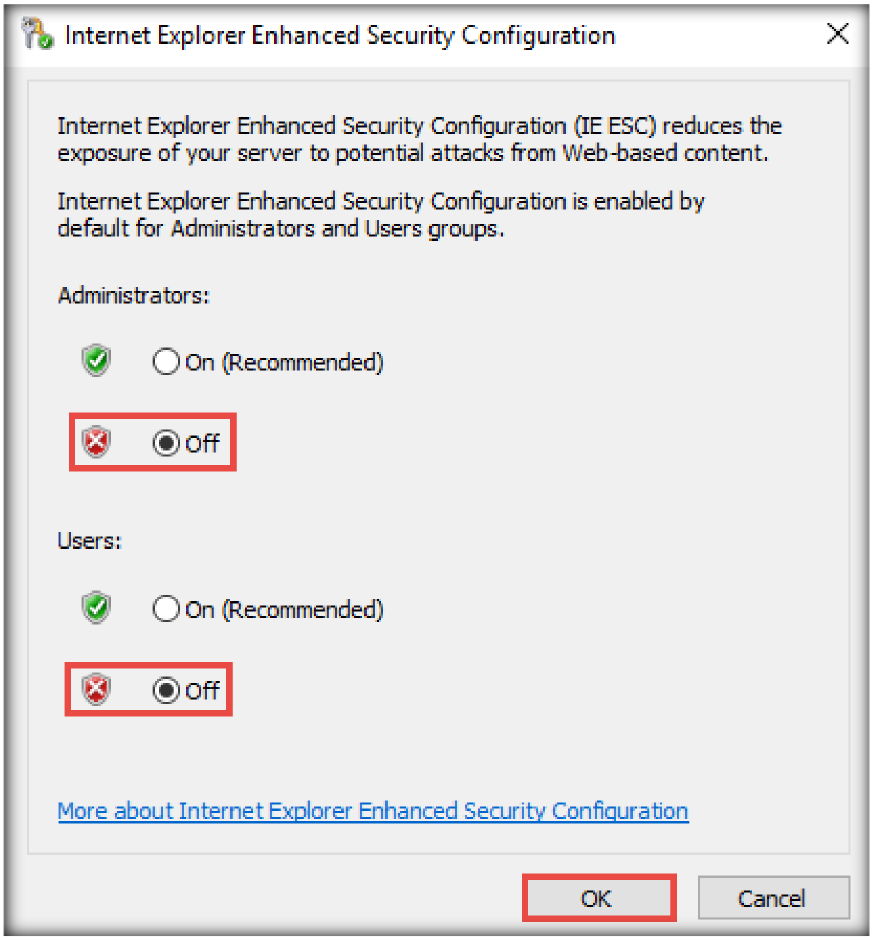


Server Manager
Server Manager ‣ Local Server
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
TASKS

PROPERTIES
For Server2019

Computer name Server2019
Workgroup WORKGROUP
Last installed updates Never
Windows Update Install updates automatically usin
Last checked for updates Never
Windows Defender Firewall Public: On
Remote management Enabled
Remote Desktop Disabled
NIC Teaming Disabled
Ethernet0 10.10.10.19, IPv6 enabled
Windows Defender Antivirus Real-Time Protection: On
Feedback & Diagnostics Settings
IE Enhanced Security Configuration On
Time zone (UTC+05:30) Chennai, Kolkata, Mu
Product ID Not activated
Operating system version Microsoft Windows Server 2019 Standard
Hardware information VMware, Inc. VMware7,1
Processors Intel(R) Core(TM) i5-4590 CPU @
Installed memory (RAM) 2 GB
Total disk space 59.68 GB

6. The **Internet Explorer Enhanced Security Configuration** window appears; select the **Off** radio button for both **Administrators** and **Users** and click **OK**.



Internet Explorer Enhanced Security Configuration

Internet Explorer Enhanced Security Configuration (IE ESC) reduces the exposure of your server to potential attacks from Web-based content.

Internet Explorer Enhanced Security Configuration is enabled by default for Administrators and Users groups.

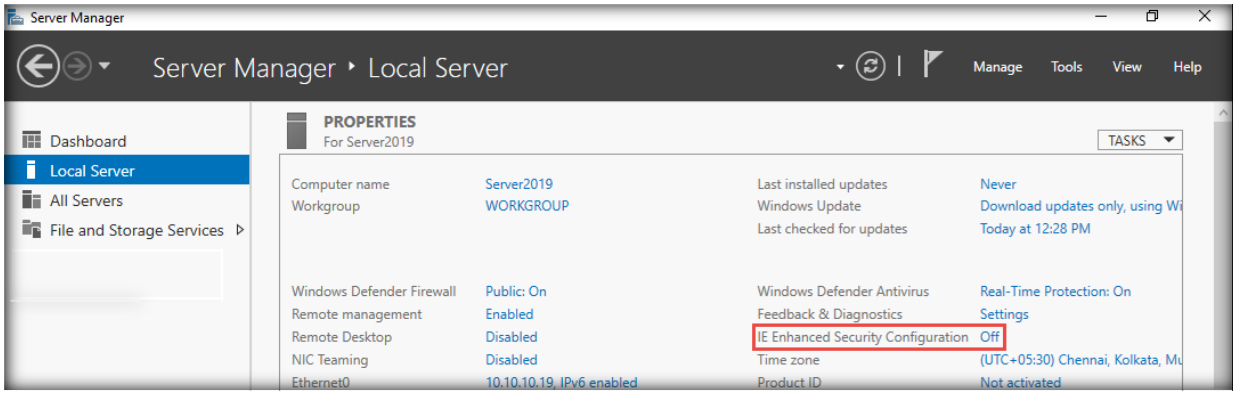
Administrators:
○ On (Recommended)
● Off

Users:
○ On (Recommended)
● Off

More about Internet Explorer Enhanced Security Configuration
OK
Cancel

7. **IE Enhanced Security Configuration** will be **Off**.

   **Note**: It takes some time to turn off the IE Enhanced Security Configuration.

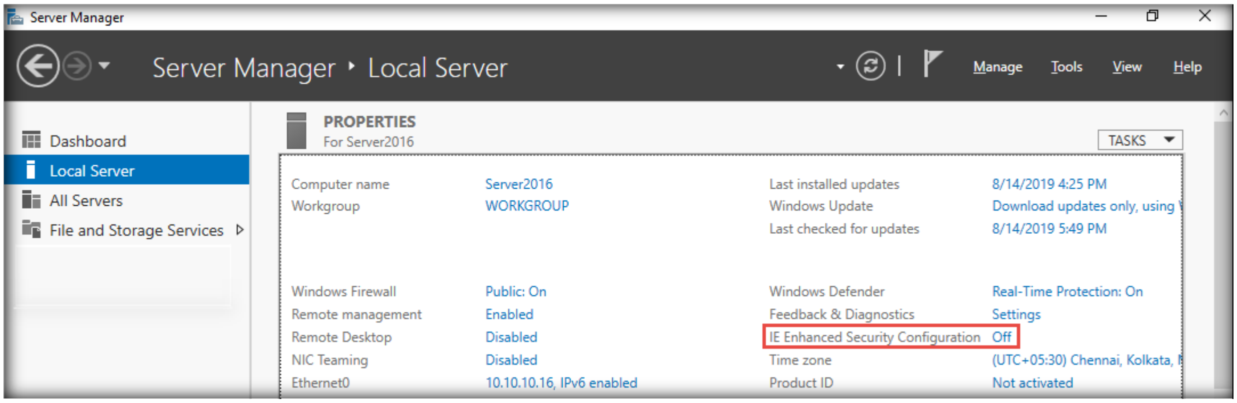

Server Manager
Server Manager ‣ Local Server
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
PROPERTIES
For Server2019
TASKS

Computer name Server2019
Workgroup WORKGROUP
Last installed updates Never
Windows Update Download updates only, using Wi
Last checked for updates Today at 12:28 PM
Windows Defender Firewall Public: On
Remote management Enabled
Remote Desktop Disabled
NIC Teaming Disabled
Ethernet0 10.10.10.19, IPv6 enabled
Windows Defender Antivirus Real-Time Protection: On
Feedback & Diagnostics Settings
IE Enhanced Security Configuration Off
Time zone (UTC+05:30) Chennai, Kolkata, Mu
Product ID Not activated

## Configure IE Enhanced Security in the Windows Server 2016 Virtual Machine

8. Similarly, configure **IE Explorer Enhanced Security Configuration** in **Windows Server 2016** as well.

   **Note**: Log in to in the **Windows Server 2016** virtual machine using the credentials **Administrator** and **Pa$$w0rd**


Server Manager
Server Manager ‣ Local Server
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
PROPERTIES
For Server2016
TASKS

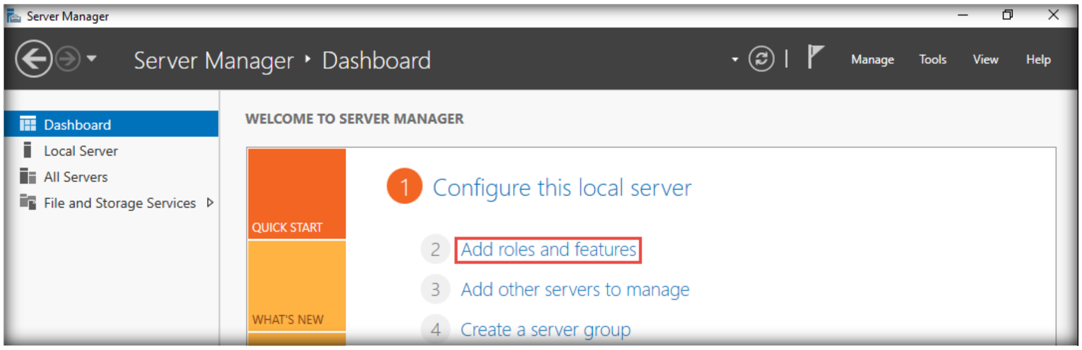
Computer name Server2016
Workgroup WORKGROUP
Last installed updates 8/14/2019 4:25 PM
Windows Update Download updates only, using
Last checked for updates 8/14/2019 5:49 PM
Windows Firewall Public: On
Remote management Enabled
Remote Desktop Disabled
NIC Teaming Disabled
Ethernet0 10.10.10.16, IPv6 enabled
Windows Defender Real-Time Protection: On
Feedback & Diagnostics Settings
IE Enhanced Security Configuration Off
Time zone (UTC+05:30) Chennai, Kolkata,
Product ID Not activated

[Back to Configuration Task Outline]

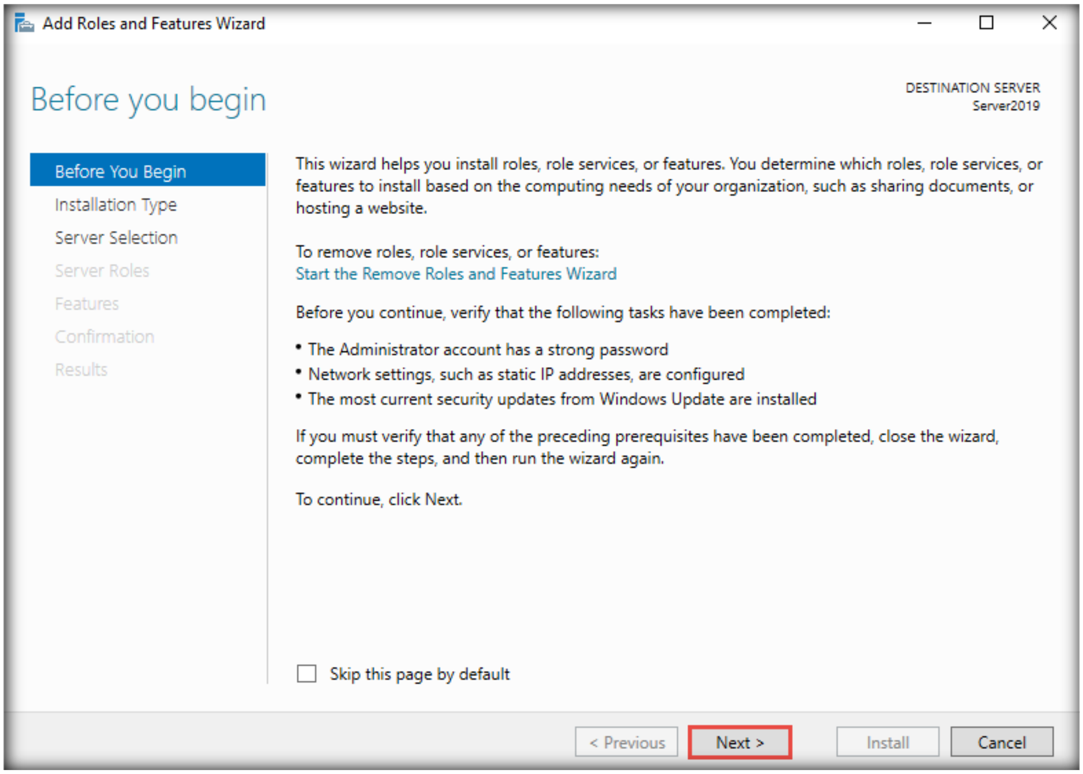
# CT#9: Add Roles IIS (Internet Information Services), File Services, and SNMP and Remote Access roles in the Windows Server 2019 and Windows Server 2016 Virtual Machines

## Add Roles on the Windows Server 2019 Virtual Machine

1. Log in to the **Windows Server 2019** virtual machine.
2. If the **Server Manager** window does not automatically appear, open **Server Manager** by clicking the **Start** menu → **Server Manager** application.
3. The **Server Manager** main window appears; by default, **Dashboard** will be selected; click **Add roles and features**.


Server Manager
Server Manager ‣ Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group

4. The **Add Roles and Features Wizard** window appears; click **Next**.


Add Roles and Features Wizard
Before you begin
DESTINATION SERVER
Server2019
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results

This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.

To remove roles, role services, or features:
Start the Remove Roles and Features Wizard

Before you continue, verify that the following tasks have been completed:

- The Administrator account has a strong password
- Network settings, such as static IP addresses, are configured
- The most current security updates from Windows Update are installed

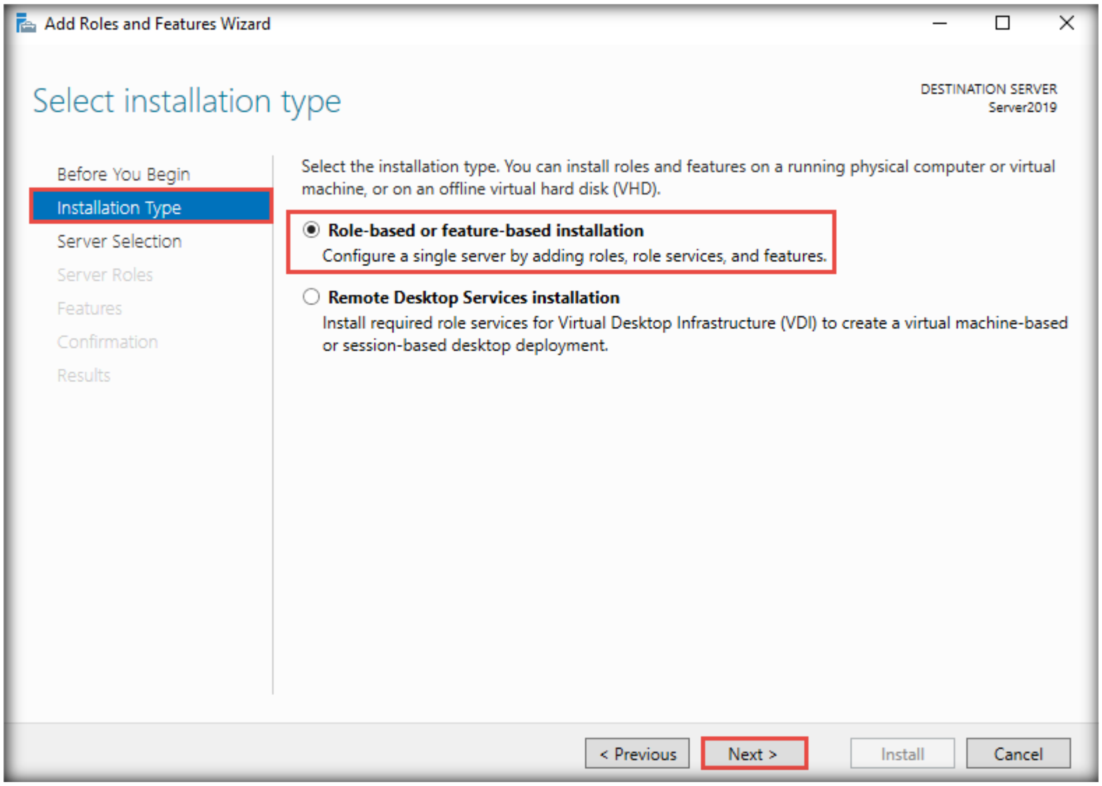
If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again.

To continue, click Next.

☐ Skip this page by default

< Previous
Next >
Install
Cancel

5. In the **Installation Type** section of the wizard, select the **Role-based or feature-based installation** radio button and click **Next**.

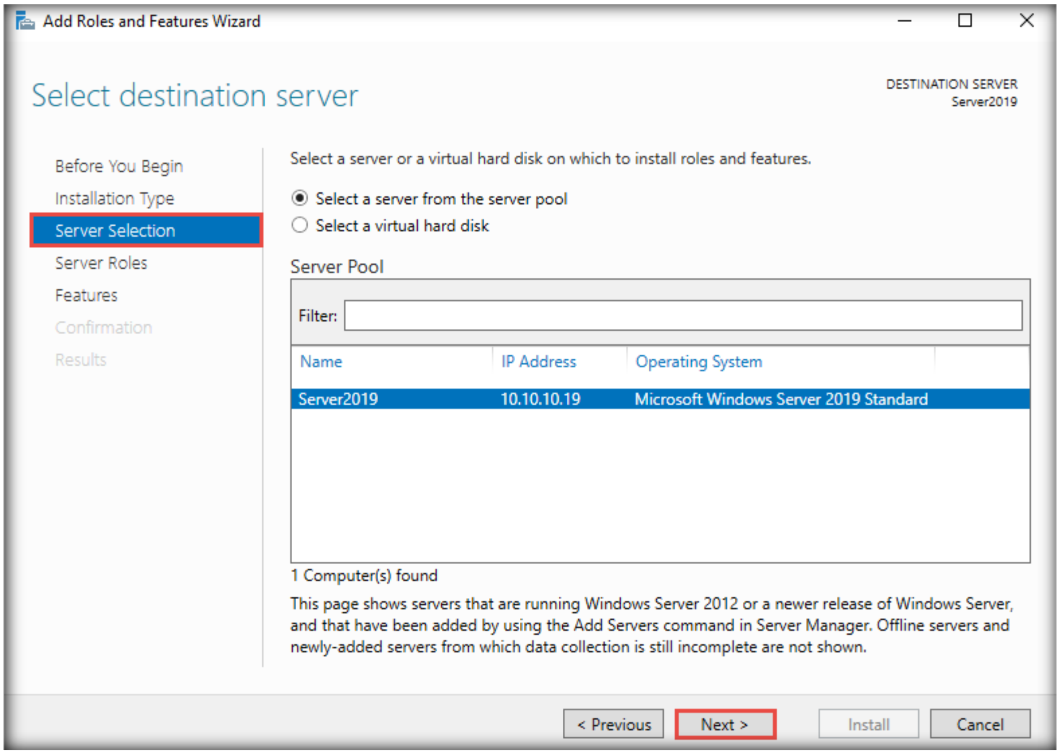

Add Roles and Features Wizard
Select installation type
DESTINATION SERVER
Server2019
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
< Previous
Next >
Install
Cancel

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

● **Role-based or feature-based installation**
Configure a single server by adding roles, role services, and features.

○ **Remote Desktop Services installation**
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.

6. In **Server Selection** section, leave the selections set to default and click **Next**.


Add Roles and Features Wizard
Select destination server
DESTINATION SERVER
Server2019
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
< Previous
Next >
Install
Cancel

Select a server or a virtual hard disk on which to install roles and features.

● Select a server from the server pool
○ Select a virtual hard disk

Server Pool

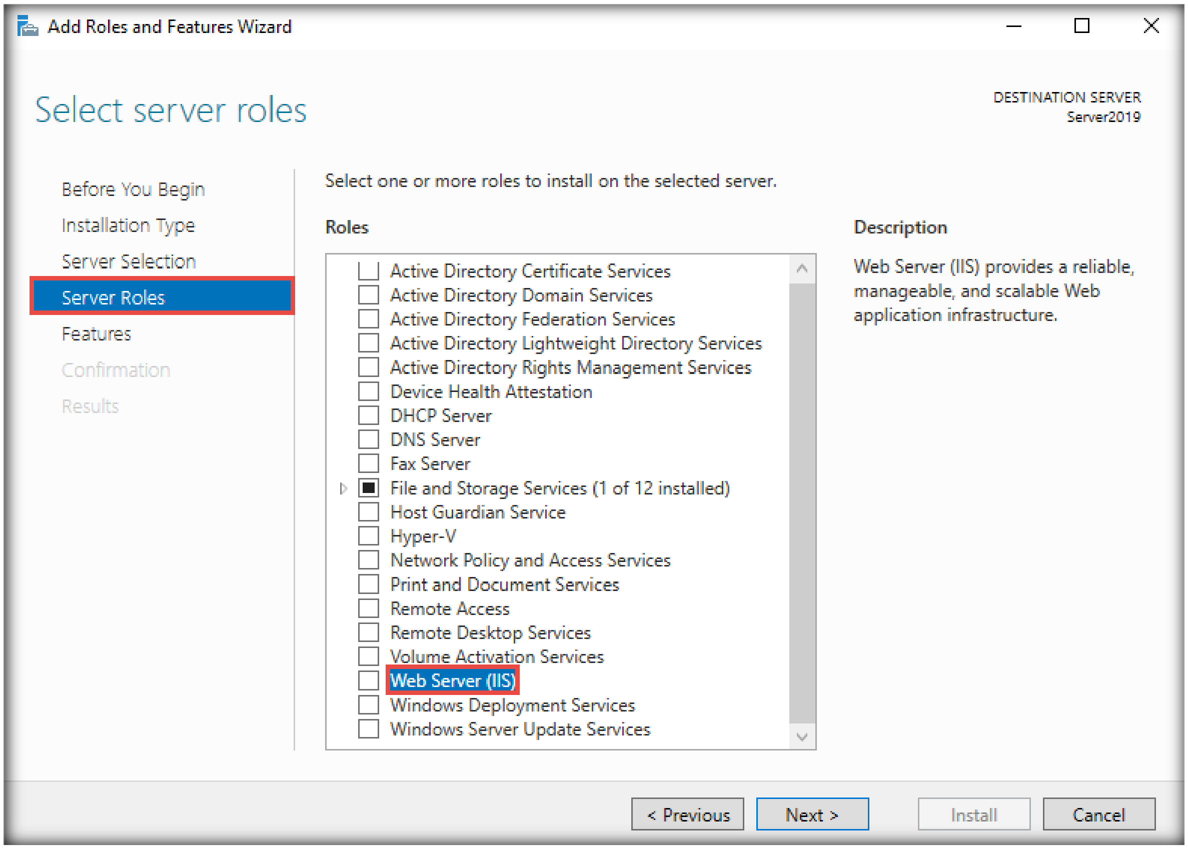
Filter:

| Name | IP Address | Operating System |
|---|---|---|
| Server2019 | 10.10.10.19 | Microsoft Windows Server 2019 Standard |

1 Computer(s) found

This page shows servers that are running Windows Server 2012 or a newer release of Windows Server, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

7. The **Server Roles** section appears; click the checkbox of the **Web Server (IIS)** role.


Add Roles and Features Wizard
Select server roles
DESTINATION SERVER
Server2019
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
< Previous
Next >
Install
Cancel

Select one or more roles to install on the selected server.

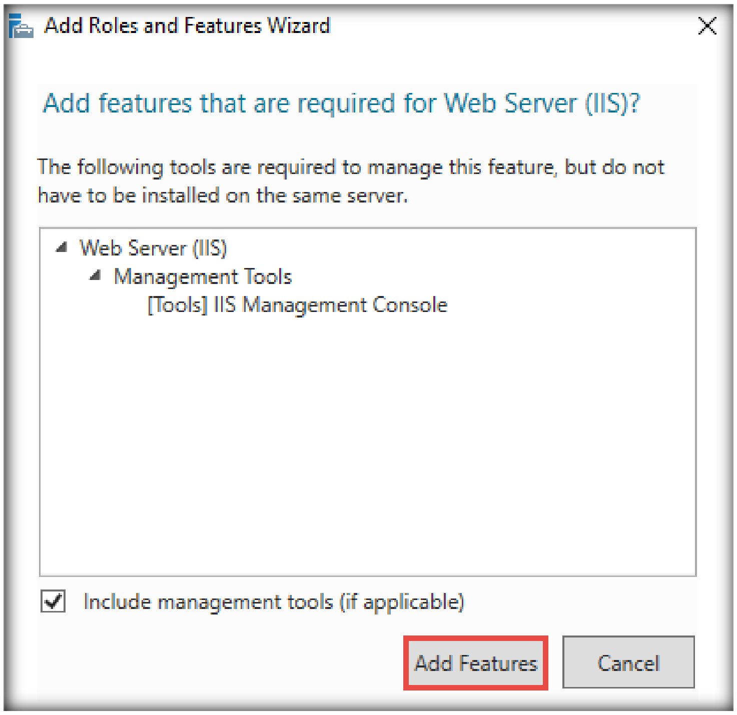
Roles

- ☐ Active Directory Certificate Services
- ☐ Active Directory Domain Services
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Device Health Attestation
- ☐ DHCP Server
- ☐ DNS Server
- ☐ Fax Server
- ■ File and Storage Services (1 of 12 installed)
- ☐ Host Guardian Service
- ☐ Hyper-V
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services
- ☐ Volume Activation Services
- ☐ Web Server (IIS)
- ☐ Windows Deployment Services
- ☐ Windows Server Update Services

Description

Web Server (IIS) provides a reliable, manageable, and scalable Web application infrastructure.

8. The **Add Roles and Features Wizard** window appears; click **Add Features**.


Add Roles and Features Wizard
Add Features
Cancel

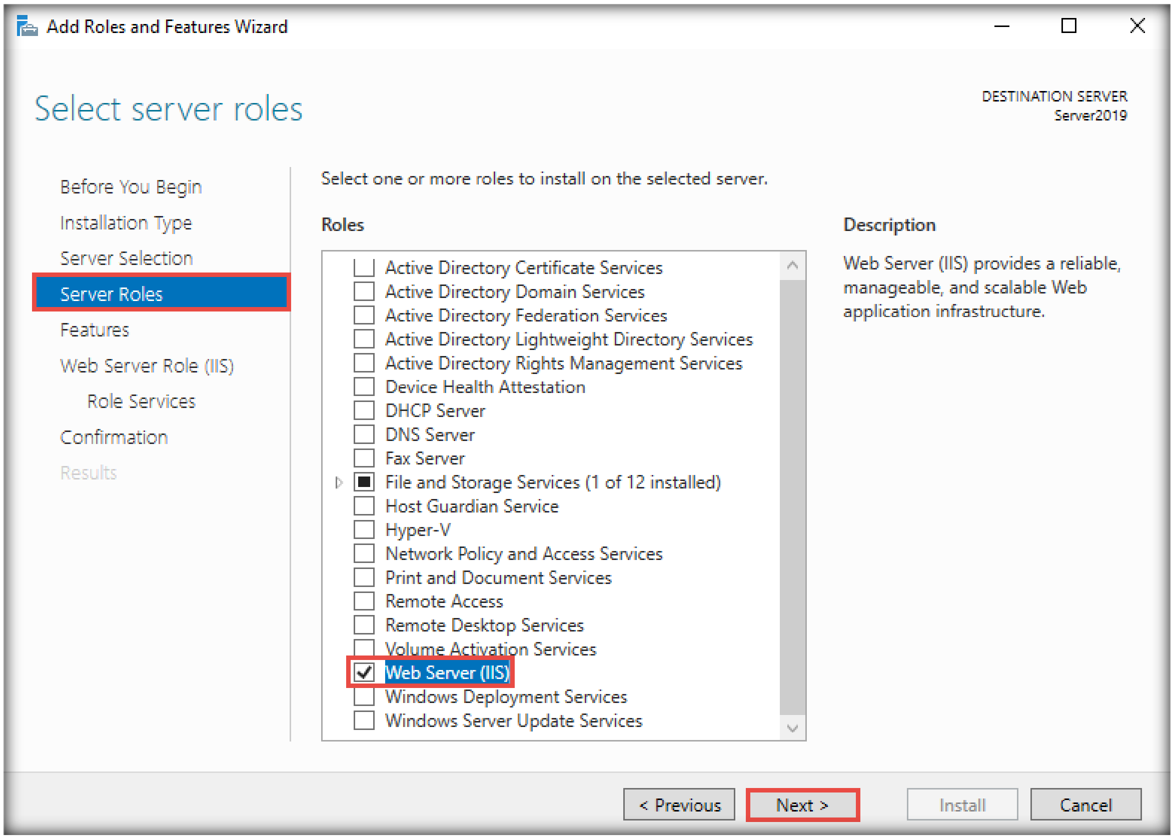
Add features that are required for Web Server (IIS)?

The following tools are required to manage this feature, but do not have to be installed on the same server.

- Web Server (IIS)
  - Management Tools
    - [Tools] IIS Management Console

☑ Include management tools (if applicable)

9. In the **Server Roles** section, you will observe the **Web Server (IIS)** option is checked; click **Next**.

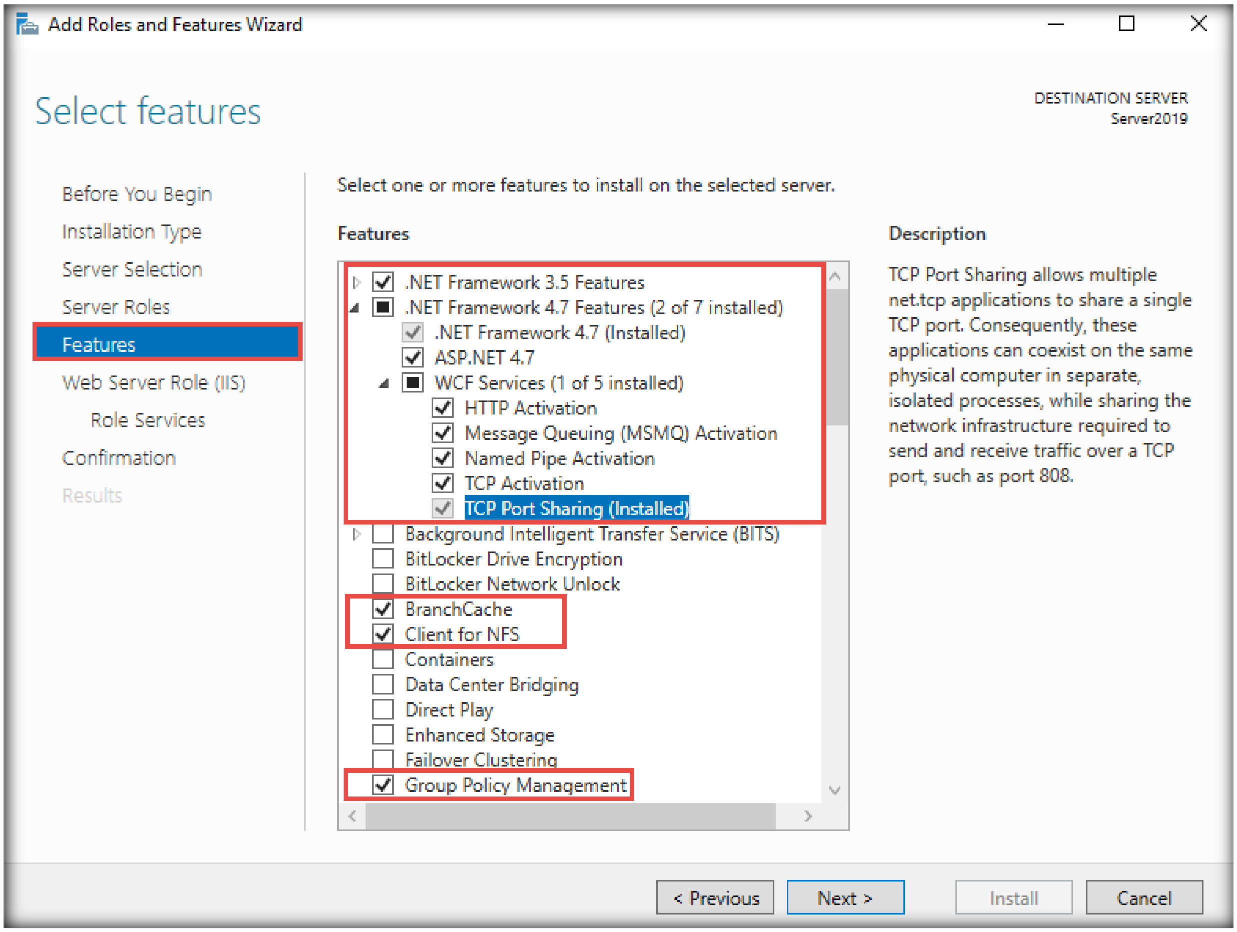

Add Roles and Features Wizard
Select server roles
DESTINATION SERVER
Server2019
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results
Roles
Description
< Previous
Next >
Install
Cancel

Select one or more roles to install on the selected server.

☐ Active Directory Certificate Services
☐ Active Directory Domain Services
☐ Active Directory Federation Services
☐ Active Directory Lightweight Directory Services
☐ Active Directory Rights Management Services
☐ Device Health Attestation
☐ DHCP Server
☐ DNS Server
☐ Fax Server
■ File and Storage Services (1 of 12 installed)
☐ Host Guardian Service
☐ Hyper-V
☐ Network Policy and Access Services
☐ Print and Document Services
☐ Remote Access
☐ Remote Desktop Services
☐ Volume Activation Services
☑ Web Server (IIS)
☐ Windows Deployment Services
☐ Windows Server Update Services

Web Server (IIS) provides a reliable, manageable, and scalable Web application infrastructure.

10. The **Features** section appears; select the checkboxes for the **.NET Framework 3.5 Features**, **BranchCache**, **Client for NFS**, and **Group Policy Management** features, as well as all the checkboxes under **.NET Framework 4.7 Features**. Click the **Add Features** button if you get a prompt for the features to be added while selecting the features.



Add Roles and Features Wizard
Select features
DESTINATION SERVER
Server2019
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results
< Previous
Next >
Install
Cancel

Select one or more features to install on the selected server.

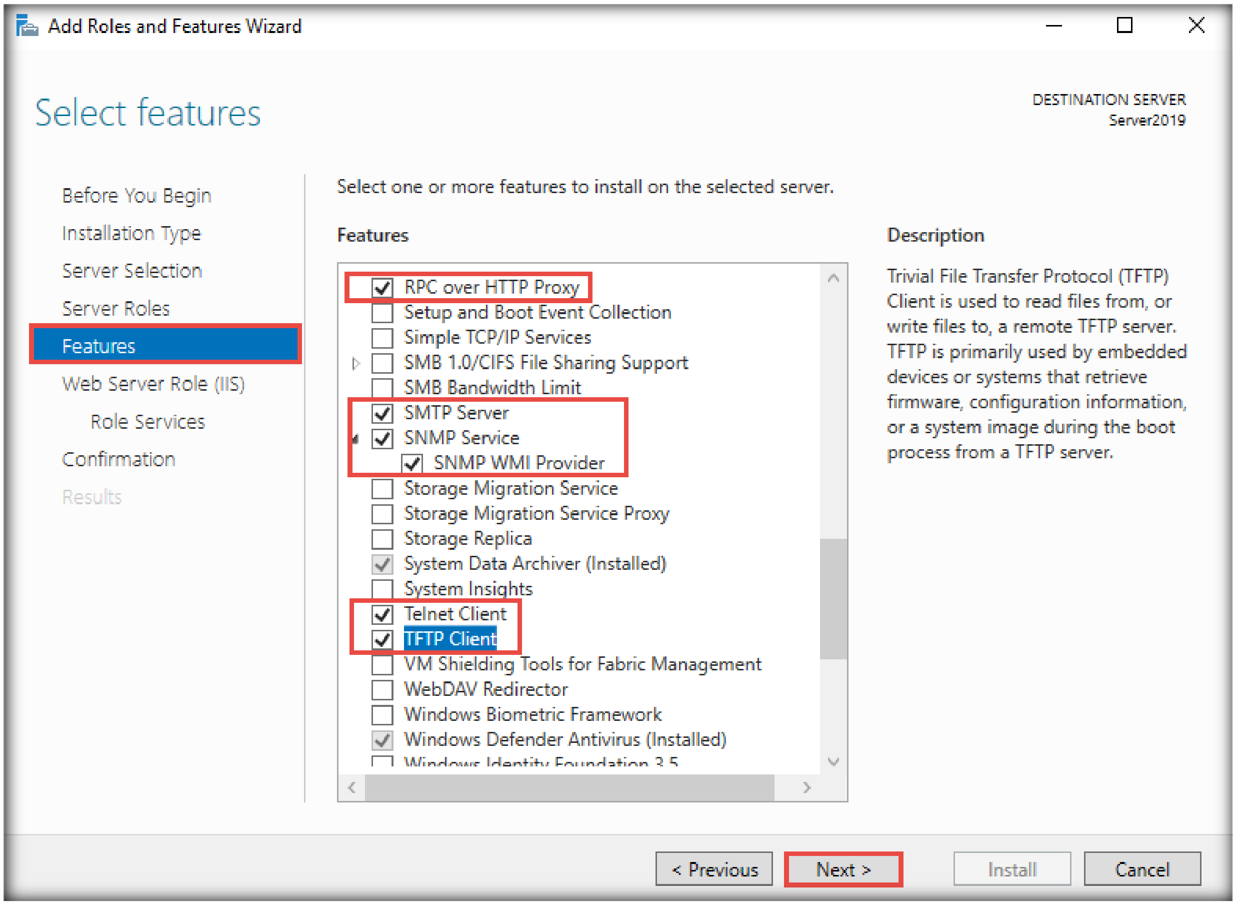
**Features**

- ☑ .NET Framework 3.5 Features
- ■ .NET Framework 4.7 Features (2 of 7 installed)
  - ☑ .NET Framework 4.7 (Installed)
  - ☑ ASP.NET 4.7
  - ■ WCF Services (1 of 5 installed)
    - ☑ HTTP Activation
    - ☑ Message Queuing (MSMQ) Activation
    - ☑ Named Pipe Activation
    - ☑ TCP Activation
    - ☑ TCP Port Sharing (Installed)
- ☐ Background Intelligent Transfer Service (BITS)
- ☐ BitLocker Drive Encryption
- ☐ BitLocker Network Unlock
- ☑ BranchCache
- ☑ Client for NFS
- ☐ Containers
- ☐ Data Center Bridging
- ☐ Direct Play
- ☐ Enhanced Storage
- ☐ Failover Clustering
- ☑ Group Policy Management

**Description**

TCP Port Sharing allows multiple net.tcp applications to share a single TCP port. Consequently, these applications can coexist on the same physical computer in separate, isolated processes, while sharing the network infrastructure required to send and receive traffic over a TCP port, such as port 808.

11. Scroll down the section and check **RPC over HTTP Proxy**, **SMTP Server**, and **SNMP WMI Provider** under the **SNMP Service** feature, and the **Telnet Client** and **TFTP Client** roles. Click the **Add Features** button if you get a prompt for the features to be added while selecting the features; click **Next**.

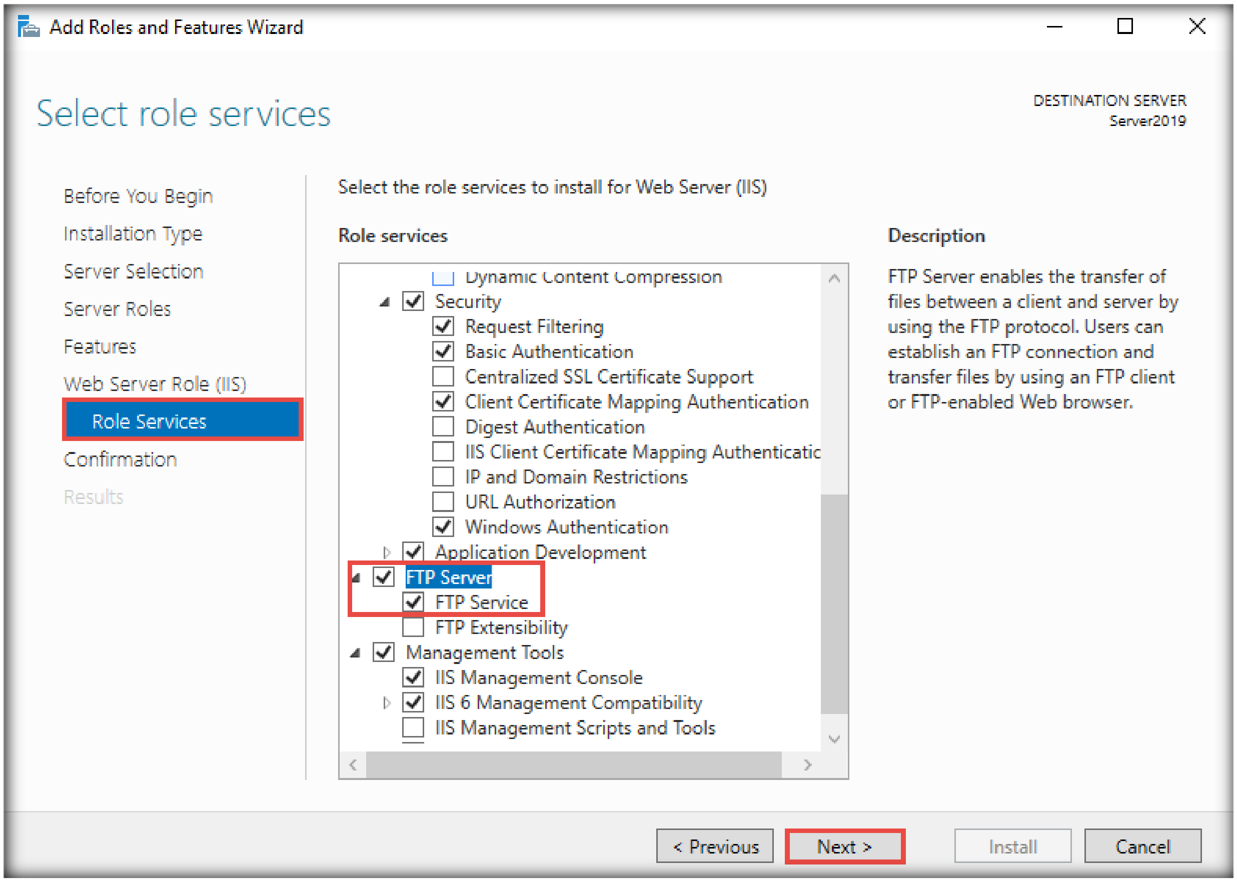

Add Roles and Features Wizard
Select features
DESTINATION SERVER
Server2019
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results
Features
Description
< Previous
Next >
Install
Cancel

Select one or more features to install on the selected server.

- ☑ RPC over HTTP Proxy
- ☐ Setup and Boot Event Collection
- ☐ Simple TCP/IP Services
- ☐ SMB 1.0/CIFS File Sharing Support
- ☐ SMB Bandwidth Limit
- ☑ SMTP Server
- ☑ SNMP Service
  - ☑ SNMP WMI Provider
- ☐ Storage Migration Service
- ☐ Storage Migration Service Proxy
- ☐ Storage Replica
- ☑ System Data Archiver (Installed)
- ☐ System Insights
- ☑ Telnet Client
- ☑ TFTP Client
- ☐ VM Shielding Tools for Fabric Management
- ☐ WebDAV Redirector
- ☐ Windows Biometric Framework
- ☑ Windows Defender Antivirus (Installed)
- ☐ Windows Identity Foundation 3.5

Trivial File Transfer Protocol (TFTP) Client is used to read files from, or write files to, a remote TFTP server. TFTP is primarily used by embedded devices or systems that retrieve firmware, configuration information, or a system image during the boot process from a TFTP server.

12. The **Web Server Role (IIS)** section appears in the wizard; click **Next**.
13. The **Role Services** section appears in the wizard. Scroll down **Role services** and check **FTP Service** under the **FTP Server** role. Then, click **Next**.



Add Roles and Features Wizard

Select role services

DESTINATION SERVER
Server2019

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results

Select the role services to install for Web Server (IIS)

Role services

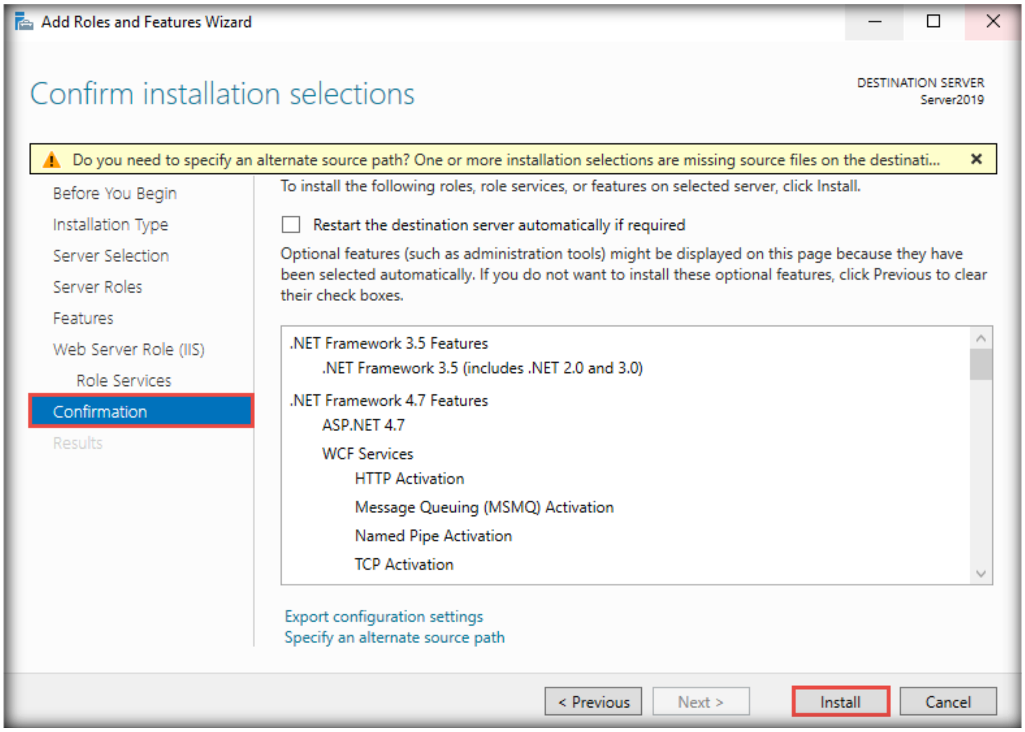
- ☐ Dynamic Content Compression
- ☑ Security
  - ☑ Request Filtering
  - ☑ Basic Authentication
  - ☐ Centralized SSL Certificate Support
  - ☑ Client Certificate Mapping Authentication
  - ☐ Digest Authentication
  - ☐ IIS Client Certificate Mapping Authenticatic
  - ☐ IP and Domain Restrictions
  - ☐ URL Authorization
  - ☑ Windows Authentication
- ☑ Application Development
- ☑ FTP Server
  - ☑ FTP Service
  - ☐ FTP Extensibility
- ☑ Management Tools
  - ☑ IIS Management Console
  - ☑ IIS 6 Management Compatibility
  - ☐ IIS Management Scripts and Tools

Description

FTP Server enables the transfer of files between a client and server by using the FTP protocol. Users can establish an FTP connection and transfer files by using an FTP client or FTP-enabled Web browser.

< Previous
Next >
Install
Cancel

14. The **Confirmation** section appears in the wizard; click **Install** (ignore the warning under the **Confirm installation selections** wizard).



Add Roles and Features Wizard

Confirm installation selections

DESTINATION SERVER
Server2019

Do you need to specify an alternate source path? One or more installation selections are missing source files on the destinati...

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results

To install the following roles, role services, or features on selected server, click Install.

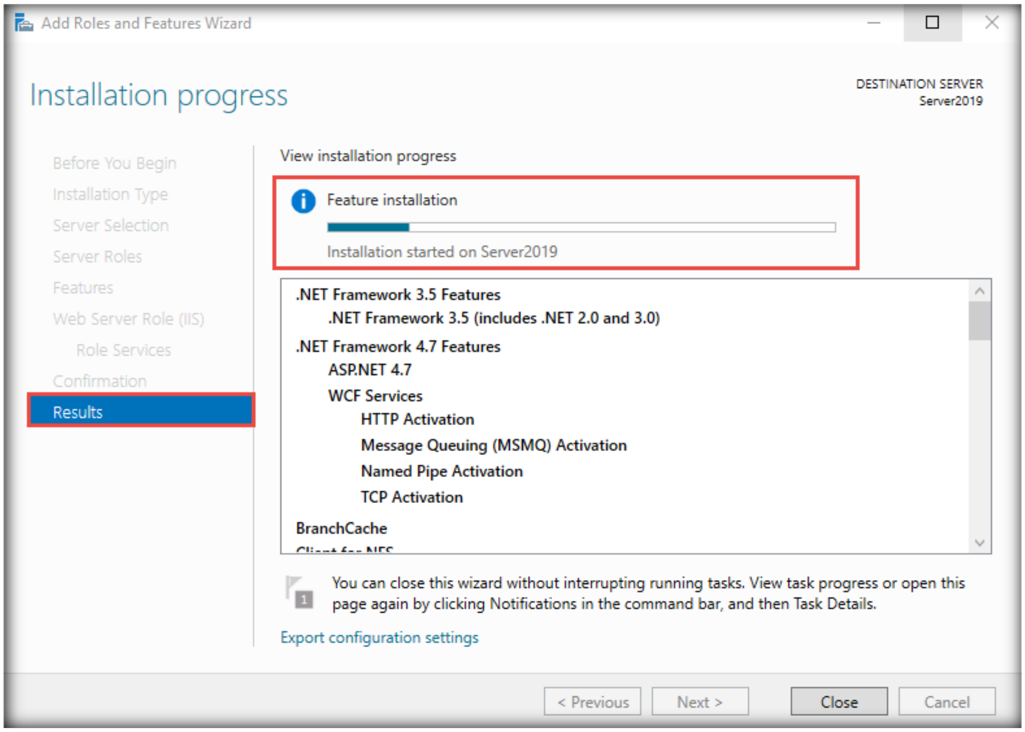
☐ Restart the destination server automatically if required

Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.

.NET Framework 3.5 Features
  .NET Framework 3.5 (includes .NET 2.0 and 3.0)
.NET Framework 4.7 Features
  ASP.NET 4.7
  WCF Services
    HTTP Activation
    Message Queuing (MSMQ) Activation
    Named Pipe Activation
    TCP Activation

Export configuration settings
Specify an alternate source path
< Previous
Next >
Install
Cancel

15. In the **Results** section of the **Add Roles and Features** wizard, **View Installation progress** will show the installation progress of the features. It will take a while to **complete** the installation of the selected roles.



Add Roles and Features Wizard

Installation progress

DESTINATION SERVER
Server2019

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results

View installation progress

Feature installation

Installation started on Server2019

.NET Framework 3.5 Features
  .NET Framework 3.5 (includes .NET 2.0 and 3.0)
.NET Framework 4.7 Features
  ASP.NET 4.7
  WCF Services
    HTTP Activation
    Message Queuing (MSMQ) Activation
    Named Pipe Activation
    TCP Activation
BranchCache

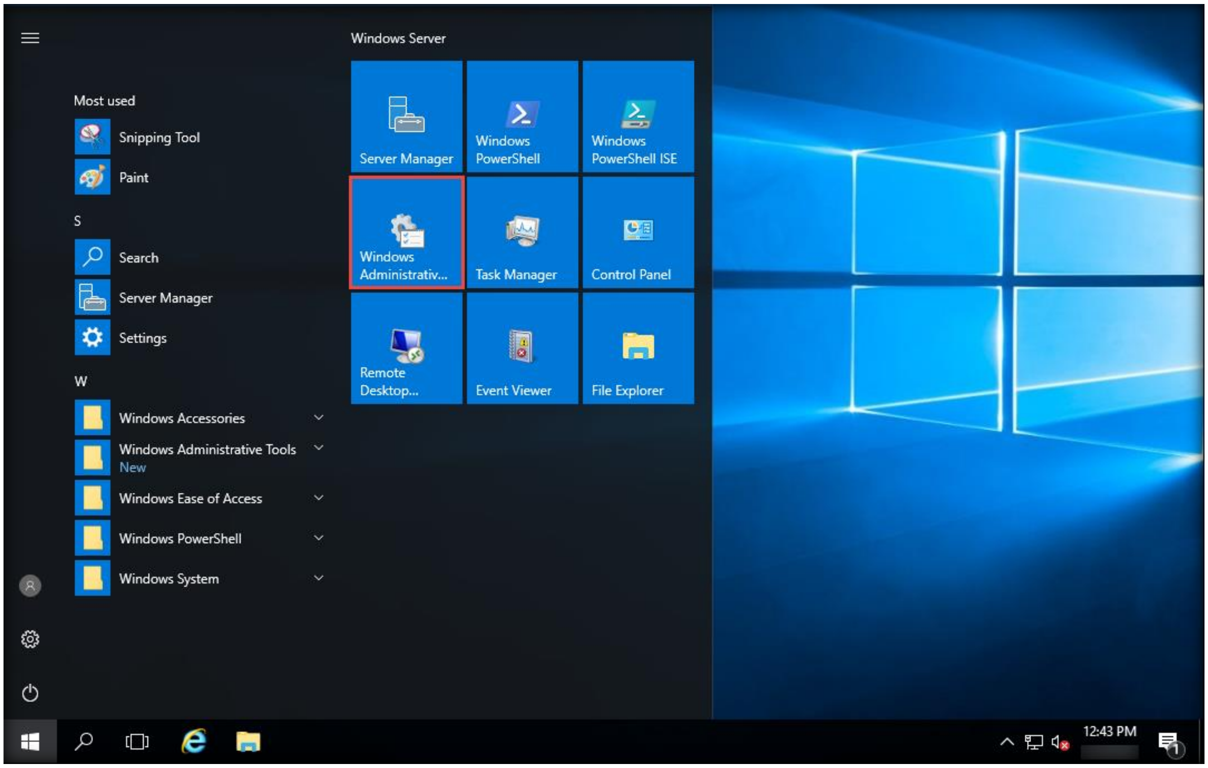
You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.

Export configuration settings
< Previous
Next >
Close
Cancel

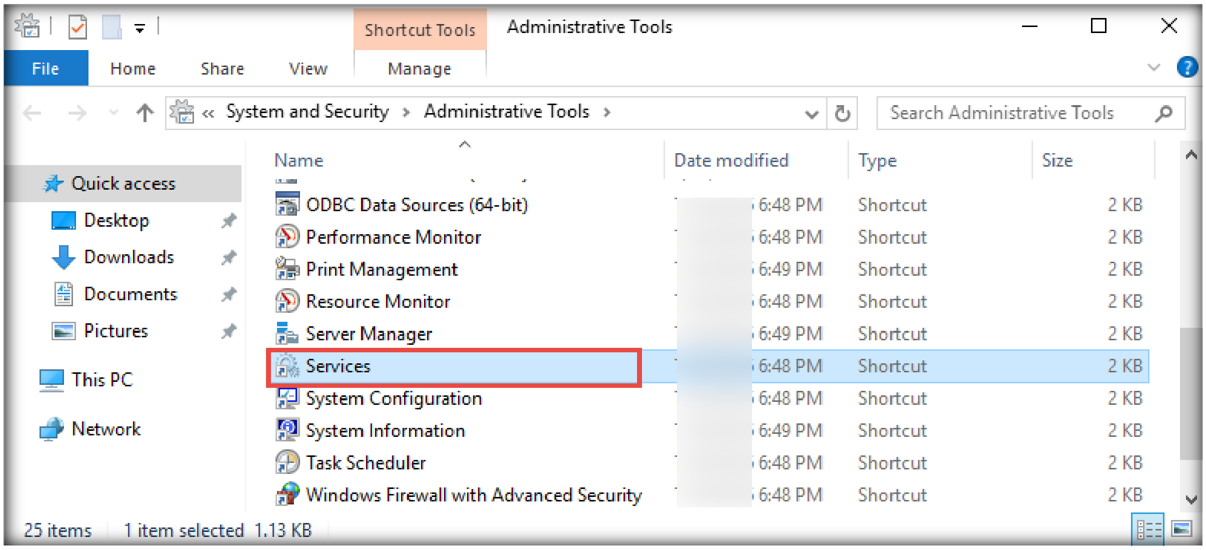
16. After the completion of installation, click the **Close** button and turn off the virtual machine.

## Add Roles in the Windows Server 2016 Virtual Machine

17. Similarly, install all the above roles and services in the **Windows Server 2016** virtual machine.
18. After installing all the services on the **Windows Server 2016** virtual machine, stop **World Wide Web Publishing Service** and **IIS Admin Service**. To do this, navigate to **Start → Windows Administrative Tools**.


Windows Server
Server Manager
Windows PowerShell
Windows PowerShell ISE
Windows Administrativ...
Task Manager
Control Panel
Remote Desktop...
Event Viewer
File Explorer
Most used
Snipping Tool
Paint
S
Search
Server Manager
Settings
W
Windows Accessories
Windows Administrative Tools
New
Windows Ease of Access
Windows PowerShell
Windows System
12:43 PM

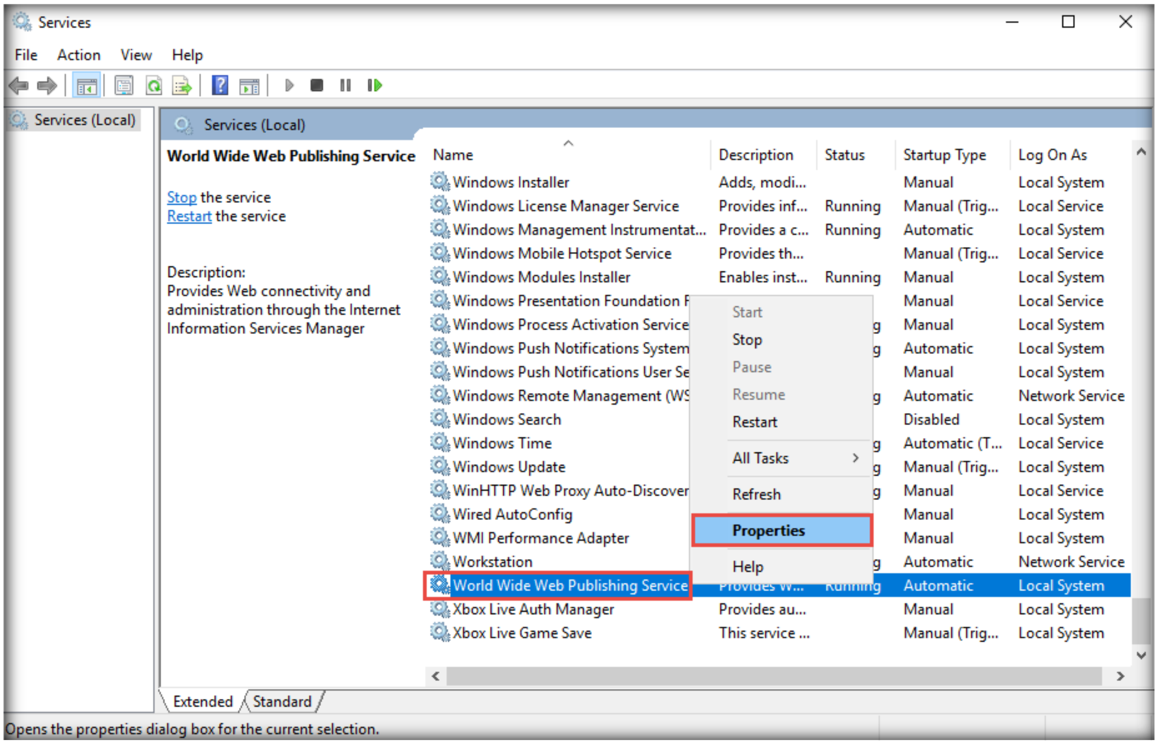
19. The **Administrative Tools** window appears; double-click **Services**.


Shortcut Tools
Administrative Tools
File
Home
Share
View
Manage
« System and Security › Administrative Tools ›
Search Administrative Tools
Quick access
Desktop
Downloads
Documents
Pictures
This PC
Network

| Name | Date modified | Type | Size |
|---|---|---|---|
| ODBC Data Sources (64-bit) | [redacted] 6:48 PM | Shortcut | 2 KB |
| Performance Monitor | [redacted] 6:48 PM | Shortcut | 2 KB |
| Print Management | [redacted] 6:49 PM | Shortcut | 2 KB |
| Resource Monitor | [redacted] 6:48 PM | Shortcut | 2 KB |
| Server Manager | [redacted] 6:49 PM | Shortcut | 2 KB |
| Services | [redacted] 6:48 PM | Shortcut | 2 KB |
| System Configuration | [redacted] 6:48 PM | Shortcut | 2 KB |
| System Information | [redacted] 6:49 PM | Shortcut | 2 KB |
| Task Scheduler | [redacted] 6:48 PM | Shortcut | 2 KB |
| Windows Firewall with Advanced Security | [redacted] 6:48 PM | Shortcut | 2 KB |

25 items 1 item selected 1.13 KB

20. The **Services** window appears; scroll down to **World Wide Web Publishing Service**, and then right-click on it and click **Properties** from the context menu.


Services
File Action View Help
Services (Local)
Services (Local)
Extended
Standard
Start
Stop
Pause
Resume
Restart
All Tasks
Refresh
Properties
Help

**World Wide Web Publishing Service**

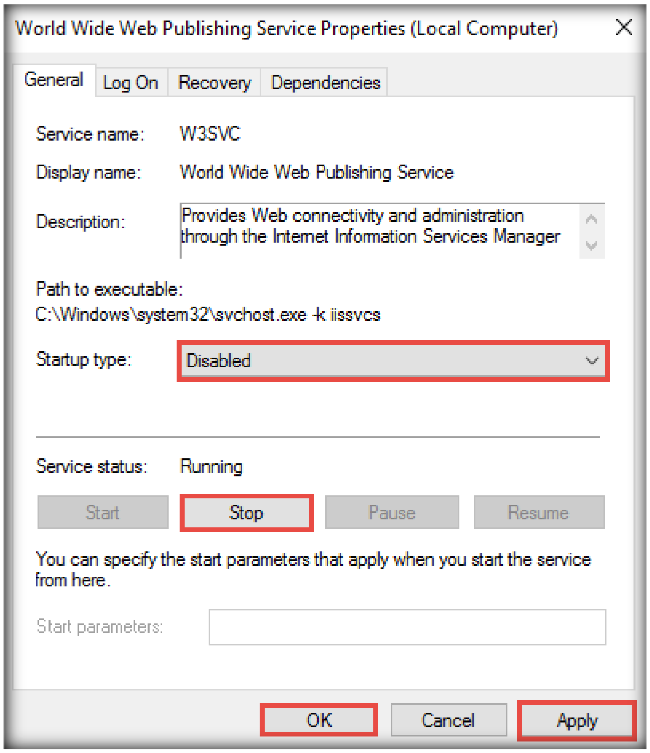
Stop the service
Restart the service

Description:
Provides Web connectivity and administration through the Internet Information Services Manager

| Name | Description | Status | Startup Type | Log On As |
|---|---|---|---|---|
| Windows Installer | Adds, modi... | | Manual | Local System |
| Windows License Manager Service | Provides inf... | Running | Manual (Trig... | Local Service |
| Windows Management Instrumentat... | Provides a c... | Running | Automatic | Local System |
| Windows Mobile Hotspot Service | Provides th... | | Manual (Trig... | Local Service |
| Windows Modules Installer | Enables inst... | Running | Manual | Local System |
| Windows Presentation Foundation F | | | Manual | Local Service |
| Windows Process Activation Service | | g | Manual | Local System |
| Windows Push Notifications System | | g | Automatic | Local System |
| Windows Push Notifications User Se | | | Manual | Local System |
| Windows Remote Management (WS | | g | Automatic | Network Service |
| Windows Search | | | Disabled | Local System |
| Windows Time | | g | Automatic (T... | Local Service |
| Windows Update | | g | Manual (Trig... | Local System |
| WinHTTP Web Proxy Auto-Discover | | g | Manual | Local Service |
| Wired AutoConfig | | | Manual | Local System |
| WMI Performance Adapter | | | Manual | Local System |
| Workstation | | g | Automatic | Network Service |
| World Wide Web Publishing Service | Provides W... | Running | Automatic | Local System |
| Xbox Live Auth Manager | Provides au... | | Manual | Local System |
| Xbox Live Game Save | This service ... | | Manual (Trig... | Local System |

Opens the properties dialog box for the current selection.

21. The **World Wide Web Publishing Service Properties (Local Computer)** window appears. In the **Startup type** drop-down box, choose **Disabled**. Under the **Service status** section, click the **Stop** button. Click **Apply** and **OK**.


World Wide Web Publishing Service Properties (Local Computer)
General
Log On
Recovery
Dependencies
Start
Stop
Pause
Resume
OK
Cancel
Apply

Service name: W3SVC

Display name: World Wide Web Publishing Service

Description: Provides Web connectivity and administration through the Internet Information Services Manager

Path to executable:
C:\Windows\system32\svchost.exe -k iissvcs

Startup type: Disabled

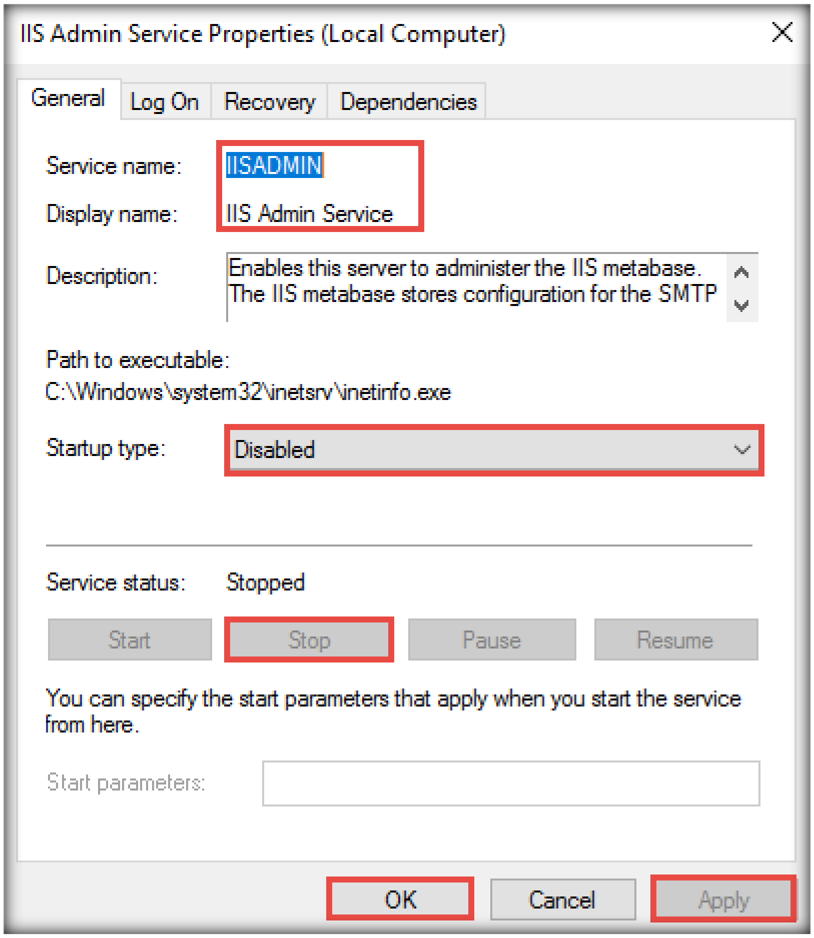
Service status: Running

You can specify the start parameters that apply when you start the service from here.

Start parameters:

22. Similarly, stop **IIS Admin Service**.

    **Note**: If a **Stop Other Services** pop-up appears while stopping the service, click **Yes** to proceed.



IIS Admin Service Properties (Local Computer)

Service name: IISADMIN

Display name: IIS Admin Service

Description: Enables this server to administer the IIS metabase. The IIS metabase stores configuration for the SMTP

Path to executable:
C:\Windows\system32\inetsrv\inetinfo.exe

Startup type: Disabled

Service status: Stopped

You can specify the start parameters that apply when you start the service from here.

General
Log On
Recovery
Dependencies
Start
Stop
Pause
Resume
Start parameters:
OK
Cancel
Apply

23. Close all windows and turn off the virtual machine.

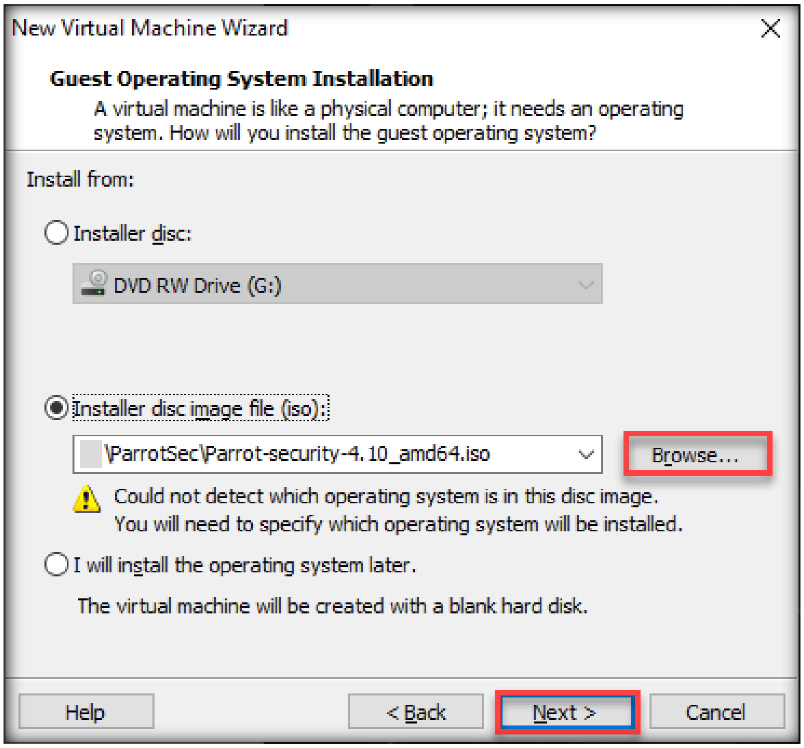
[Back to Configuration Task Outline]

## CT#10: Install the Parrot Security Virtual Machine in VMware

1. The next step is to set up the **Parrot Security** virtual machine in VMware Workstation Pro.
2. In the **VMware Workstation** window, click **Create a New Virtual Machine**.
3. In the **New Virtual Machine Wizard** window, leave the settings as their default (**Typical**) and click **Next**.
4. In the **Guest Operating System Installation** wizard, choose the **Installer disc image file (iso):** radio button. Click **Browse** to provide the ISO path of Parrot Security ISO file. Then, select the Parrot Security ISO file and click **Open** to provide the ISO path. Finally, click **Next**.

   **Note**: Here, we have used the **Parrot Security** (**MATE**) .iso file (**Parrot-security-4.10_amd.iso**) to create the **Parrot Security** virtual machine. However, you can download the latest ISO file from **https://parrotsec.org/download/**.

   **Note**: If you decide to download the latest version, the screenshots here might differ from what you see in your lab environment.



New Virtual Machine Wizard

**Guest Operating System Installation**

A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?

Install from:

○ Installer disc:

DVD RW Drive (G:)

● Installer disc image file (iso):

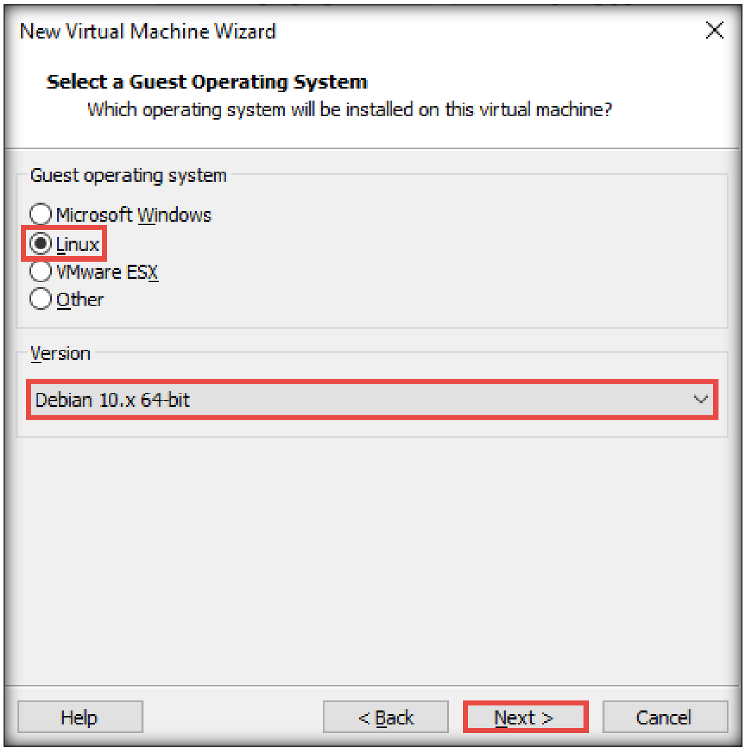
\ParrotSec\Parrot-security-4.10_amd64.iso

Could not detect which operating system is in this disc image. You will need to specify which operating system will be installed.

○ I will install the operating system later.

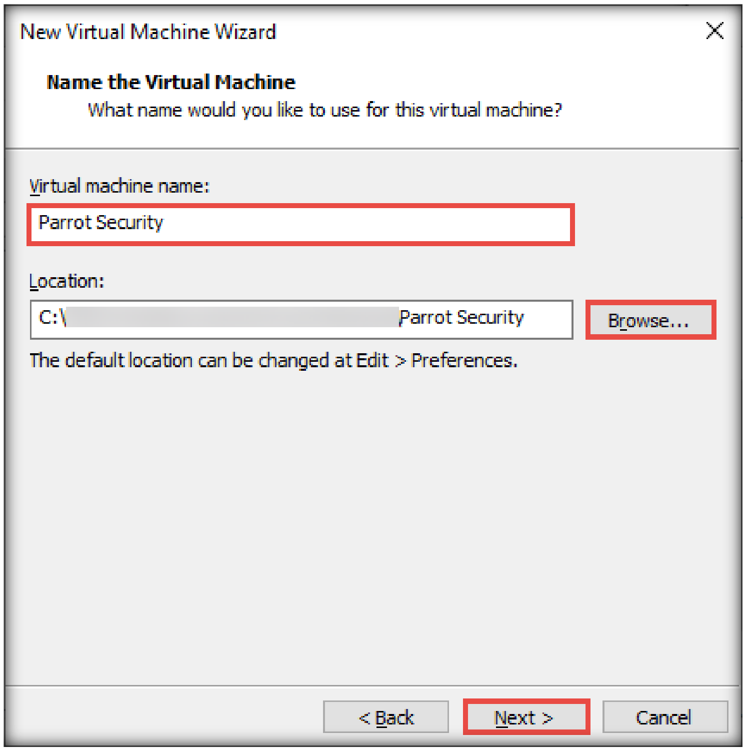
The virtual machine will be created with a blank hard disk.

5. The **Select a Guest Operating System** wizard appears. Choose the **Linux** radio button under the **Guest operating system** field and select **Debian 10.x 64-bit** in the **Version** drop-down box. Then, click **Next**.


New Virtual Machine Wizard
Select a Guest Operating System
Which operating system will be installed on this virtual machine?
Guest operating system
○ Microsoft Windows
● Linux
○ VMware ESX
○ Other
Version
Help
< Back
Next >
Cancel

Version: Debian 10.x 64-bit

6. The **Name the Virtual Machine** wizard appears. Type **Parrot Security** in the **Virtual machine name** field and click the **Browse** button to store the virtual hard disk. Then, click **Next**.

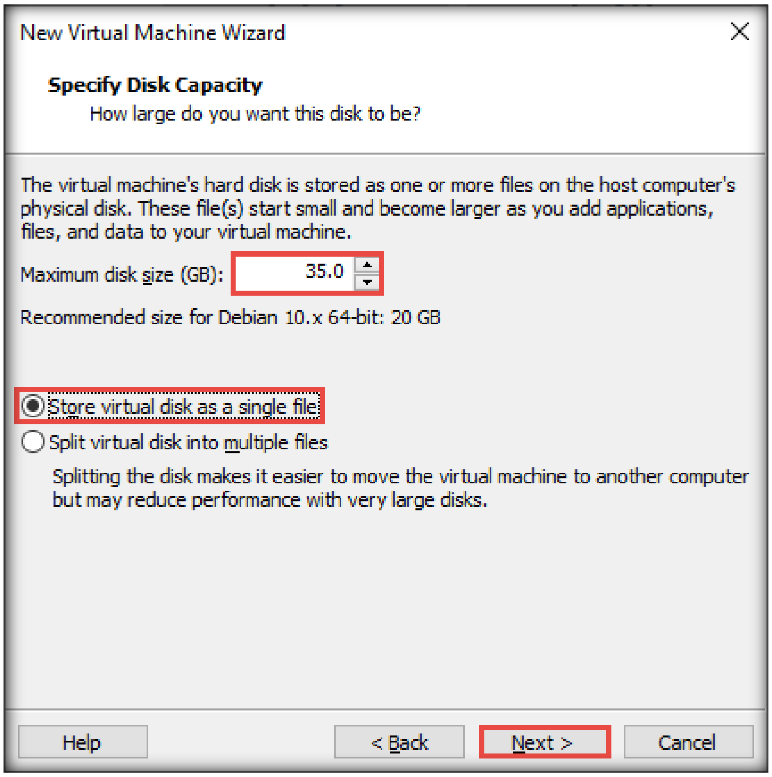

New Virtual Machine Wizard
Name the Virtual Machine
What name would you like to use for this virtual machine?
Browse...
< Back
Next >
Cancel

Virtual machine name: Parrot Security

Location: C:\ Parrot Security

The default location can be changed at Edit > Preferences.

7. The **Specify Disk Capacity** wizard appears; type **35.0 GB** in **Maximum disk size (GB)** and choose the **Store virtual disk as a single file** radio button. Then, click **Next**.



New Virtual Machine Wizard

**Specify Disk Capacity**

How large do you want this disk to be?

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (GB): 35.0

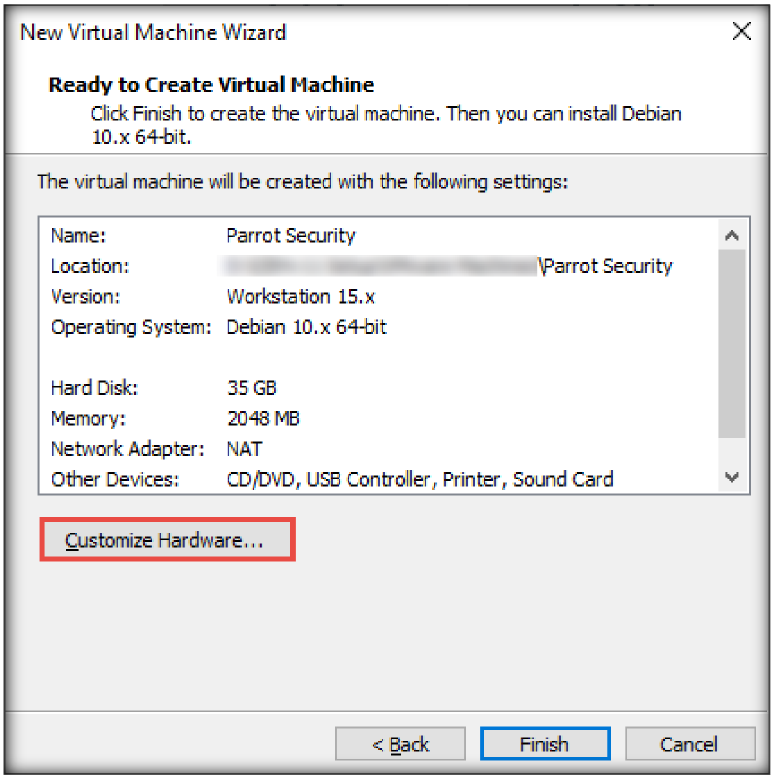
Recommended size for Debian 10.x 64-bit: 20 GB

● Store virtual disk as a single file

○ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

8. Click the **Customize Hardware...** button in the **Ready to Create Virtual Machine** wizard.



New Virtual Machine Wizard

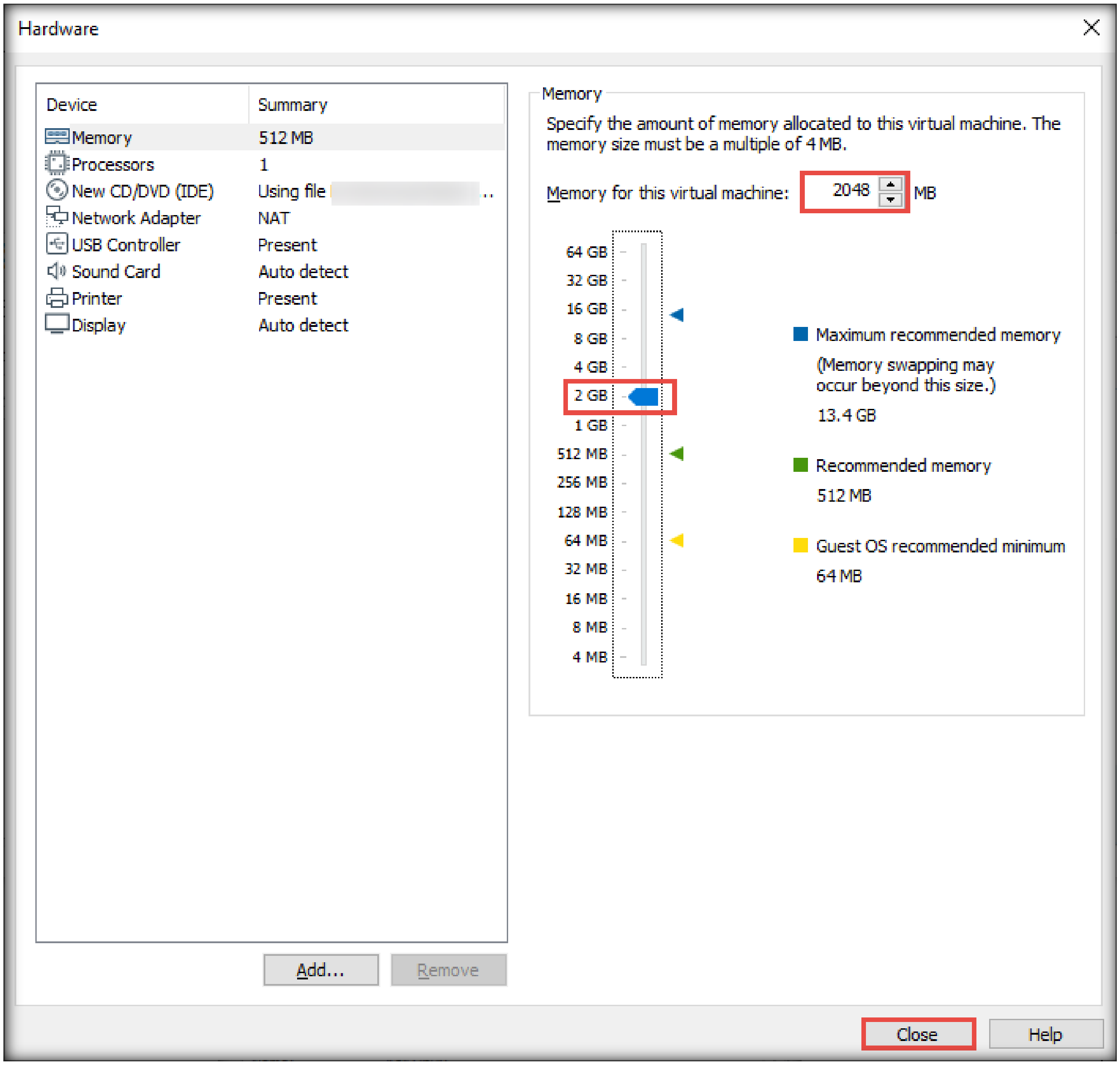
**Ready to Create Virtual Machine**

Click Finish to create the virtual machine. Then you can install Debian 10.x 64-bit.

The virtual machine will be created with the following settings:

| | |
|---|---|
| Name: | Parrot Security |
| Location: | [redacted]\Parrot Security |
| Version: | Workstation 15.x |
| Operating System: | Debian 10.x 64-bit |
| Hard Disk: | 35 GB |
| Memory: | 2048 MB |
| Network Adapter: | NAT |
| Other Devices: | CD/DVD, USB Controller, Printer, Sound Card |

9. The **Hardware** window appears; ensure that **Memory** is assigned as **2 GB** or **2048 MB** and click **Close**.



Hardware

| Device | Summary |
|---|---|
| Memory | 512 MB |
| Processors | 1 |
| New CD/DVD (IDE) | Using file [redacted] .. |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

Memory

Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.

Memory for this virtual machine: 2048 MB

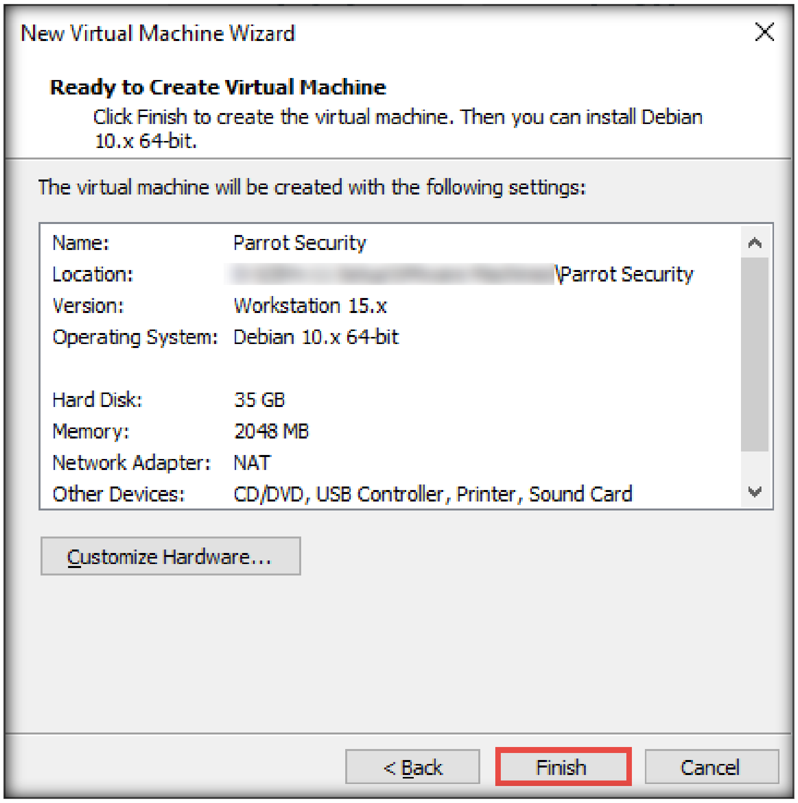
🟦 Maximum recommended memory
(Memory swapping may occur beyond this size.)
13.4 GB

🟩 Recommended memory
512 MB

🟨 Guest OS recommended minimum
64 MB

64 GB
32 GB
16 GB
8 GB
4 GB
2 GB
1 GB
512 MB
256 MB
128 MB
64 MB
32 MB
16 MB
8 MB
4 MB
Add...
Remove
Close
Help

10. Click **Finish** in the **Ready to Create Virtual Machine** wizard.



New Virtual Machine Wizard

**Ready to Create Virtual Machine**

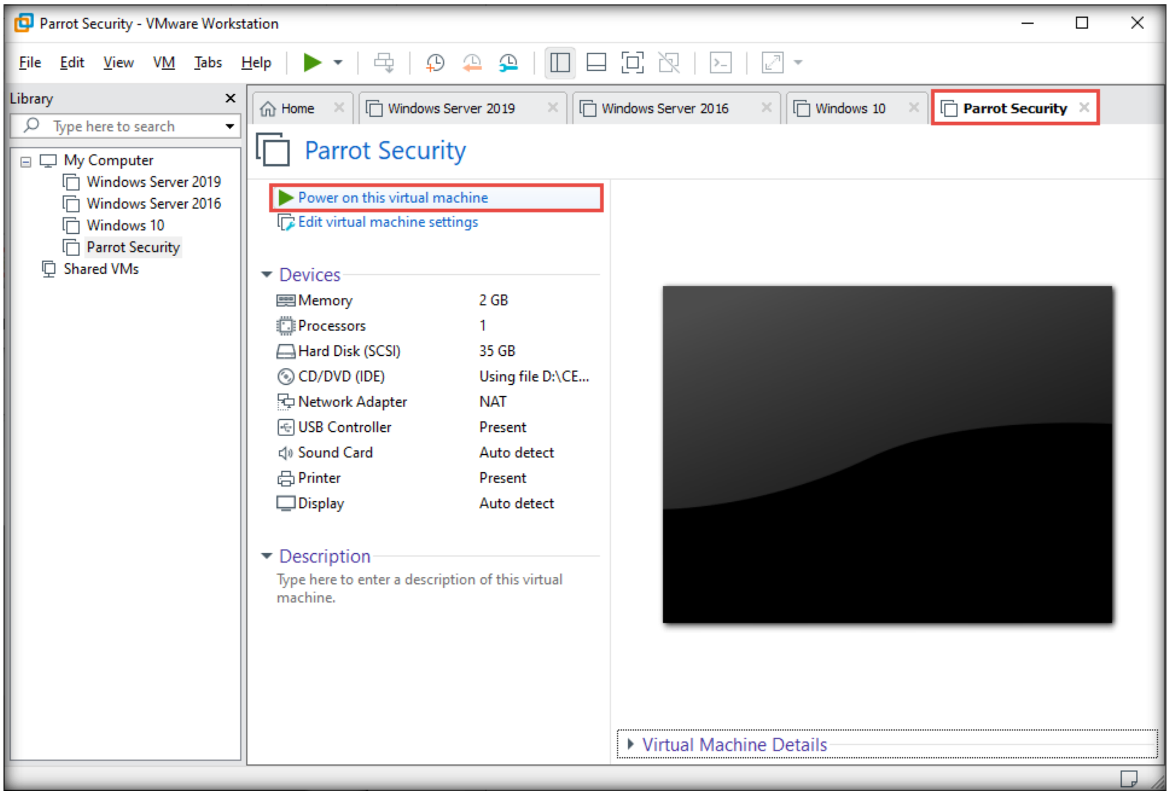
Click Finish to create the virtual machine. Then you can install Debian 10.x 64-bit.

The virtual machine will be created with the following settings:

| | |
|---|---|
| Name: | Parrot Security |
| Location: | [redacted]\Parrot Security |
| Version: | Workstation 15.x |
| Operating System: | Debian 10.x 64-bit |
| Hard Disk: | 35 GB |
| Memory: | 2048 MB |
| Network Adapter: | NAT |
| Other Devices: | CD/DVD, USB Controller, Printer, Sound Card |

Customize Hardware...
< Back
Finish
Cancel

11. In the **Parrot Security** tab, click the **Power on this virtual machine** link.

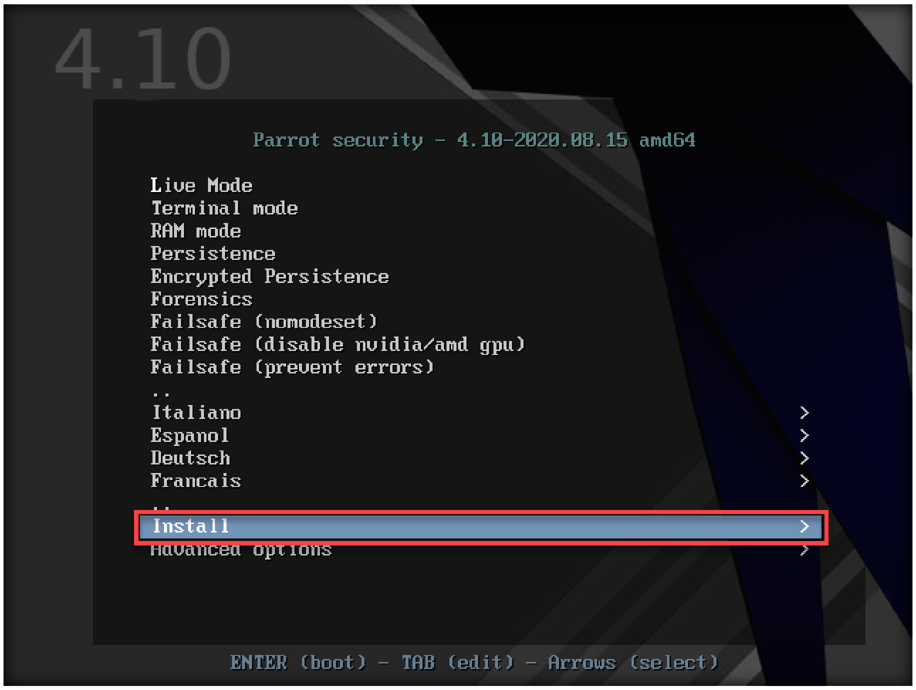


Parrot Security - VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Shared VMs
Home
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Parrot Security
Power on this virtual machine
Edit virtual machine settings
Devices

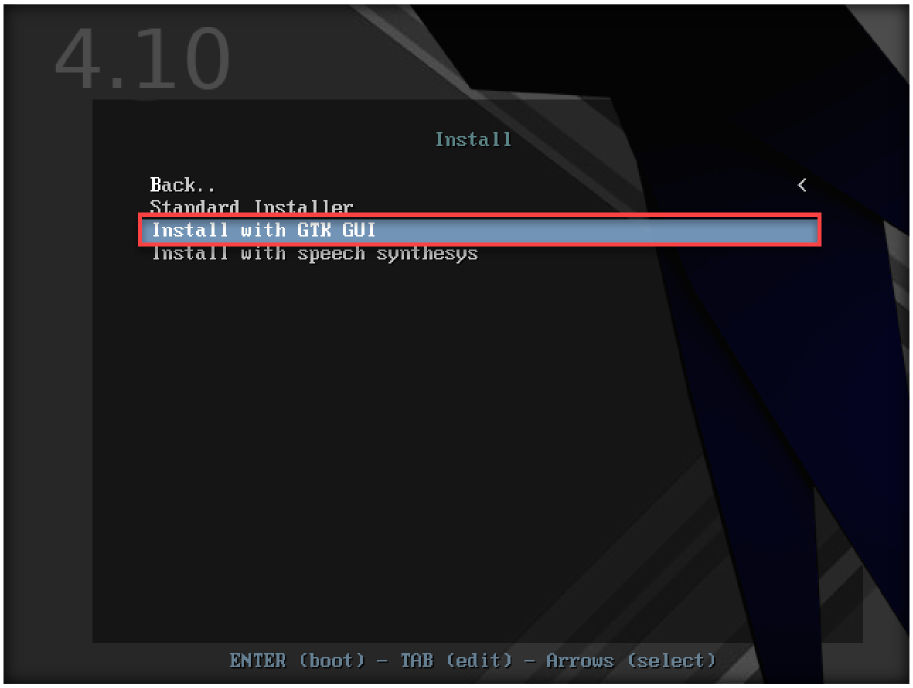
| | |
|---|---|
| Memory | 2 GB |
| Processors | 1 |
| Hard Disk (SCSI) | 35 GB |
| CD/DVD (IDE) | Using file D:\CE... |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

Description
Type here to enter a description of this virtual machine.
Virtual Machine Details

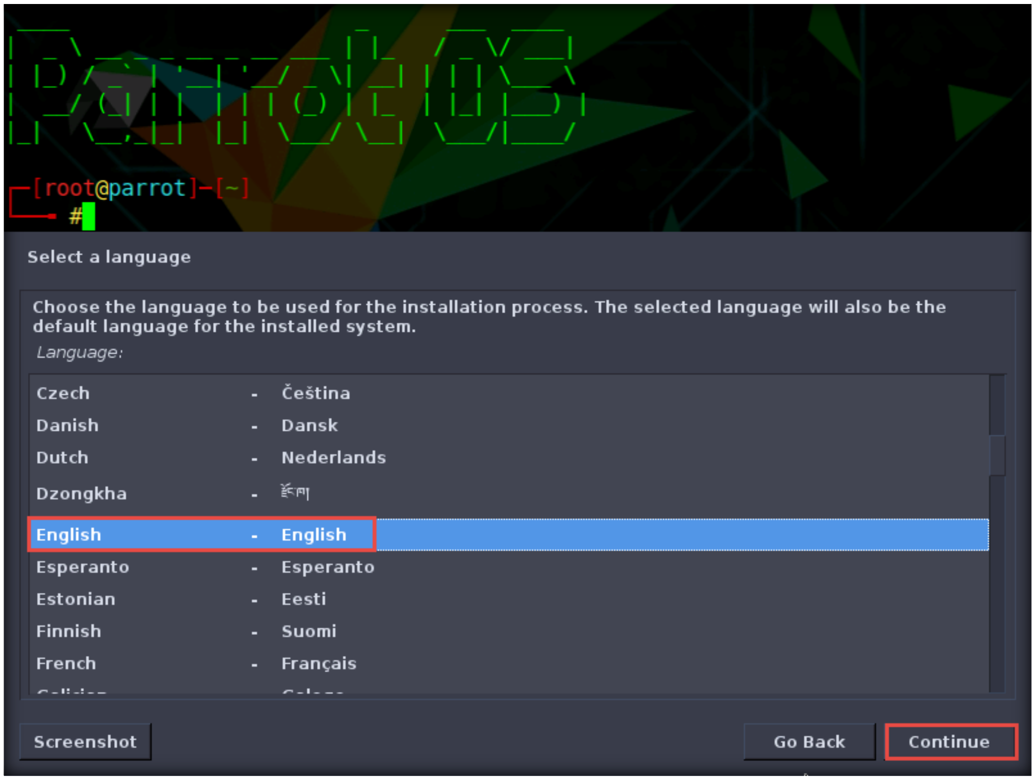
12. The **Parrot security – 4.10-2020.08.15 amd64** boot menu appears; select **Install** and press **Enter**.


4.10
Parrot security - 4.10-2020.08.15 amd64
Live Mode
Terminal mode
RAM mode
Persistence
Encrypted Persistence
Forensics
Failsafe (nomodeset)
Failsafe (disable nvidia/amd gpu)
Failsafe (prevent errors)
..
Italiano >
Espanol >
Deutsch >
Francais >
..
Install >
Advanced options >
ENTER (boot) - TAB (edit) - Arrows (select)

13. In the **Install** wizard, select **Install with GTK GUI** and press **Enter**.


4.10
Install
Back.. <
Standard Installer
Install with GTK GUI
Install with speech synthesys
ENTER (boot) - TAB (edit) - Arrows (select)

14. The **Select a language** section appears; choose a language (here, **English**) and click **Continue**.



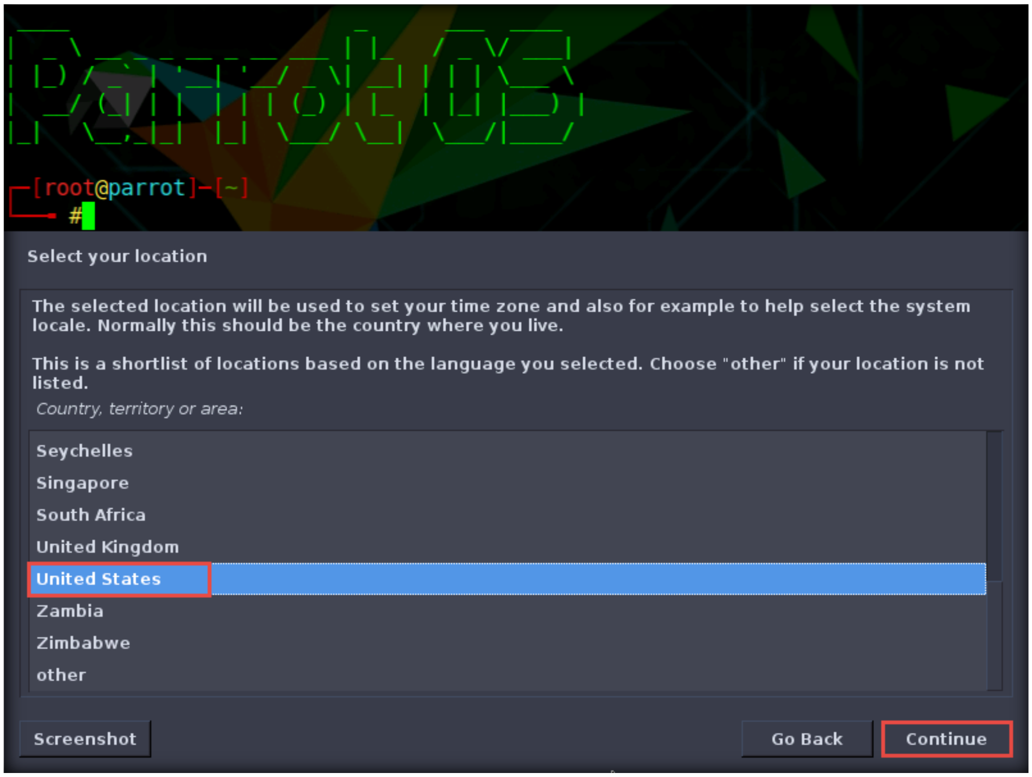
Select a language

Choose the language to be used for the installation process. The selected language will also be the default language for the installed system.

*Language:*

| | | |
|---|---|---|
| Czech | - | Čeština |
| Danish | - | Dansk |
| Dutch | - | Nederlands |
| Dzongkha | - | ཇོང་ཁ |
| English | - | English |
| Esperanto | - | Esperanto |
| Estonian | - | Eesti |
| Finnish | - | Suomi |
| French | - | Français |

15. In the **Select your location** section, choose a location (here, **United States**) and click **Continue**.



Select your location

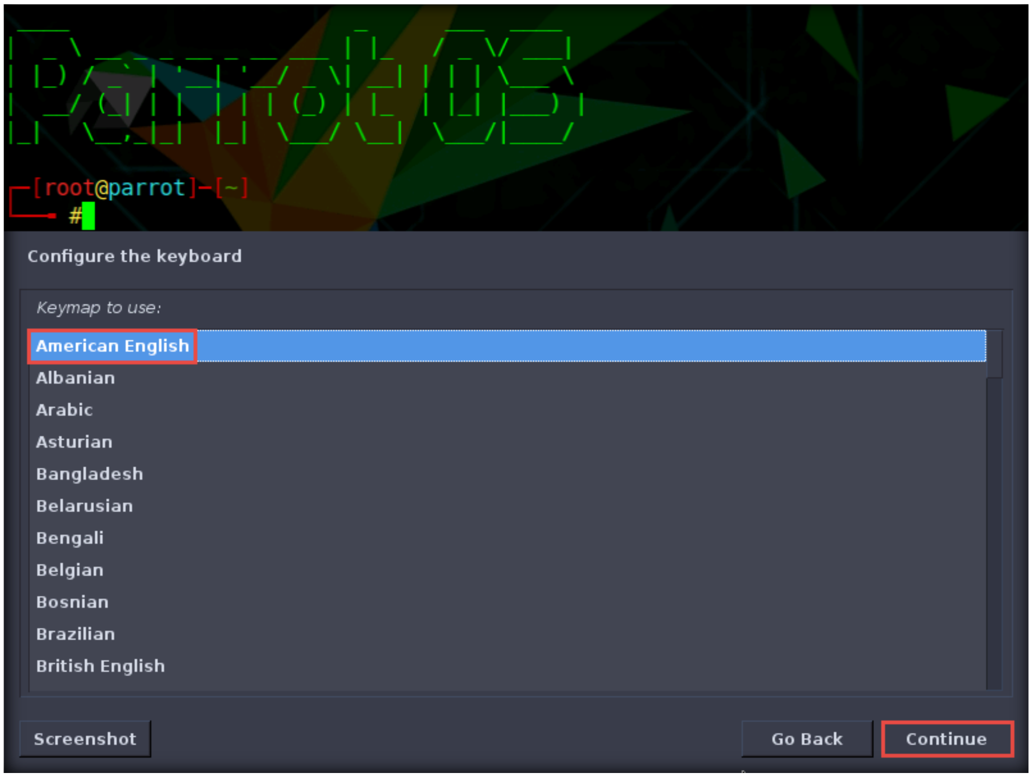
The selected location will be used to set your time zone and also for example to help select the system locale. Normally this should be the country where you live.

This is a shortlist of locations based on the language you selected. Choose "other" if your location is not listed.

*Country, territory or area:*

- Seychelles
- Singapore
- South Africa
- United Kingdom
- United States
- Zambia
- Zimbabwe
- other

16. The **Configure the keyboard** section appears; choose a language (here, **American English**) and click **Continue**.

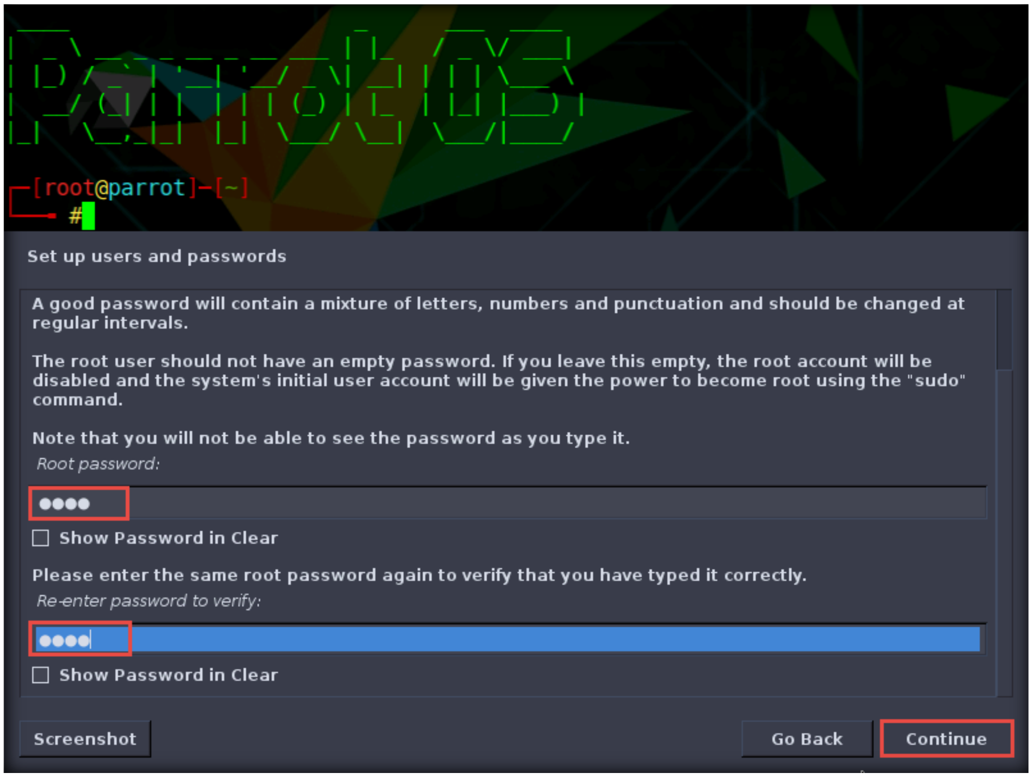


Configure the keyboard

*Keymap to use:*

- American English
- Albanian
- Arabic
- Asturian
- Bangladesh
- Belarusian
- Bengali
- Belgian
- Bosnian
- Brazilian
- British English

17. The **Set up users and passwords** section appears; enter **toor** in both the **Root password** and **Re-enter password to verify** fields, and then click **Continue**.



Set up users and passwords

A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.

The root user should not have an empty password. If you leave this empty, the root account will be disabled and the system's initial user account will be given the power to become root using the "sudo" command.

Note that you will not be able to see the password as you type it.

*Root password:* ●●●●

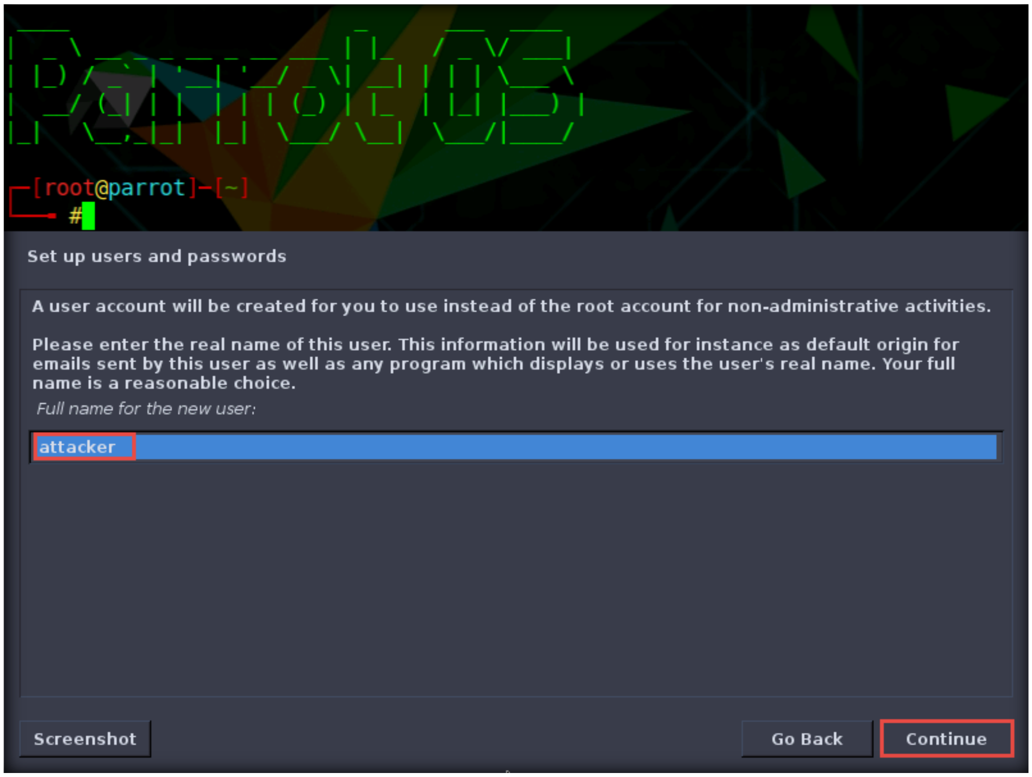
☐ Show Password in Clear

Please enter the same root password again to verify that you have typed it correctly.

*Re-enter password to verify:* ●●●●

☐ Show Password in Clear

18. On the next page, enter **attacker** in the **Full name for the new user** field and click **Continue**.



Set up users and passwords

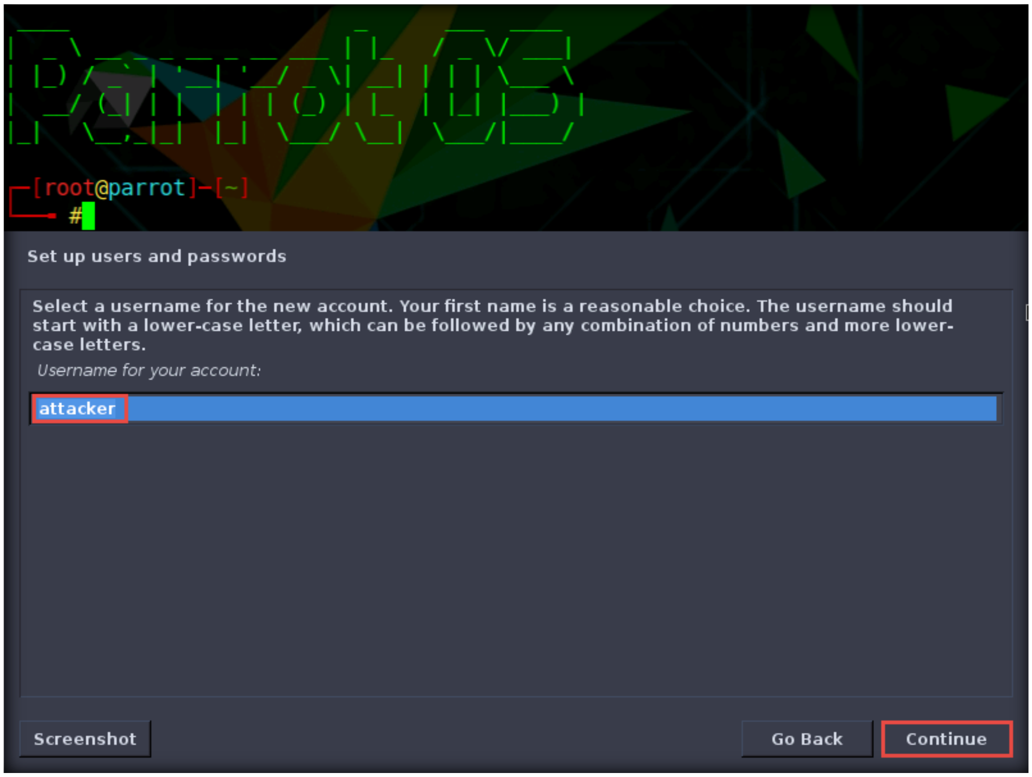
A user account will be created for you to use instead of the root account for non-administrative activities.

Please enter the real name of this user. This information will be used for instance as default origin for emails sent by this user as well as any program which displays or uses the user's real name. Your full name is a reasonable choice.

*Full name for the new user:*

attacker

19. On the next page, leave the **Username for your account** field set to default and click **Continue**.



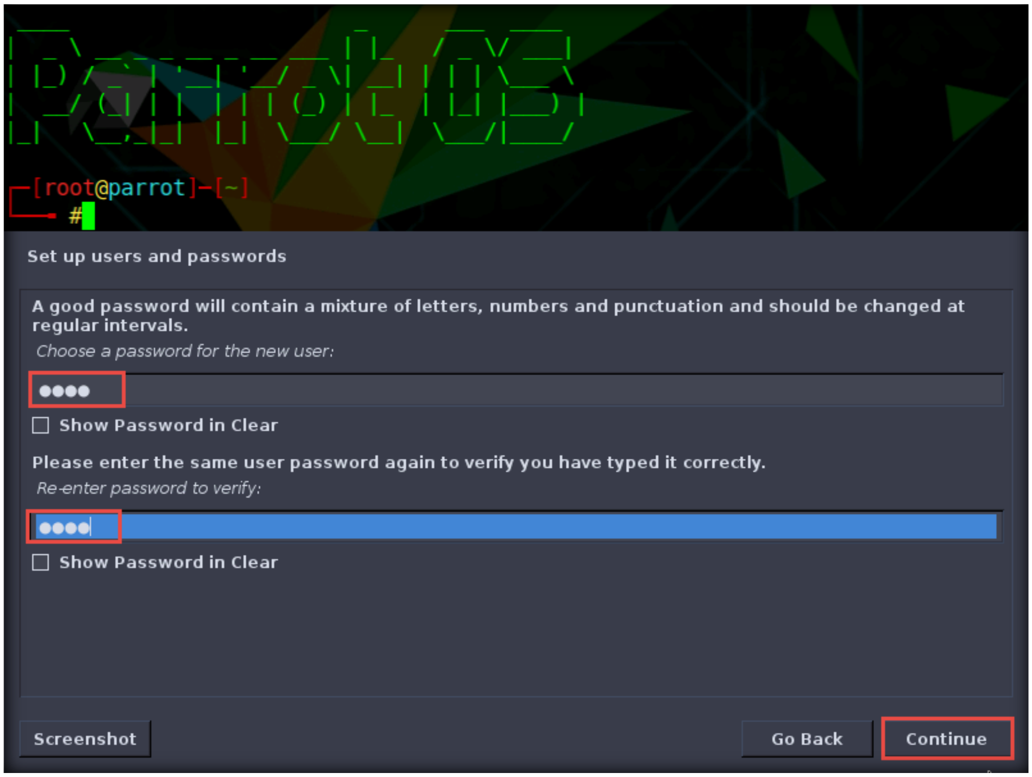
Set up users and passwords

Select a username for the new account. Your first name is a reasonable choice. The username should start with a lower-case letter, which can be followed by any combination of numbers and more lower-case letters.

*Username for your account:*

attacker

20. On the next page, enter **toor** in both the **Choose a password for the new user** and **Re-enter password to verify** fields and click **Continue**



Set up users and passwords

A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.

*Choose a password for the new user:*

●●●●

☐ Show Password in Clear

Please enter the same user password again to verify you have typed it correctly.

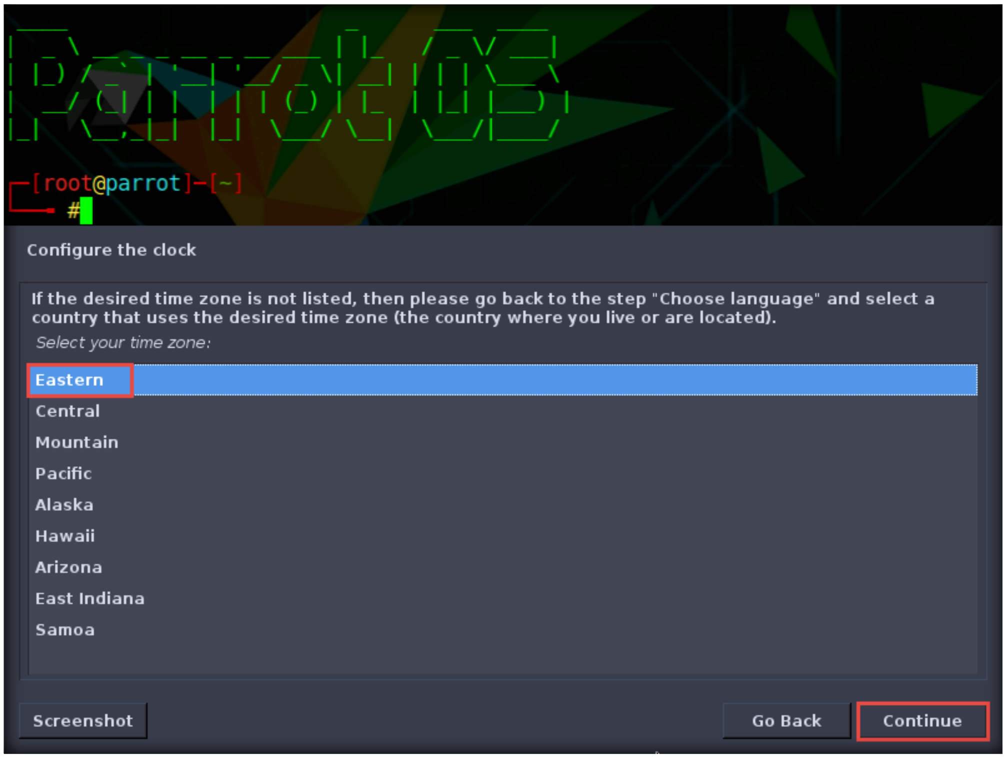
*Re-enter password to verify:*

●●●●

☐ Show Password in Clear

21. In the **Configure the clock** section, choose the time zone (here, **Eastern**) and click **Continue**.

22. Wait until the installer fetches the time from the network time server.



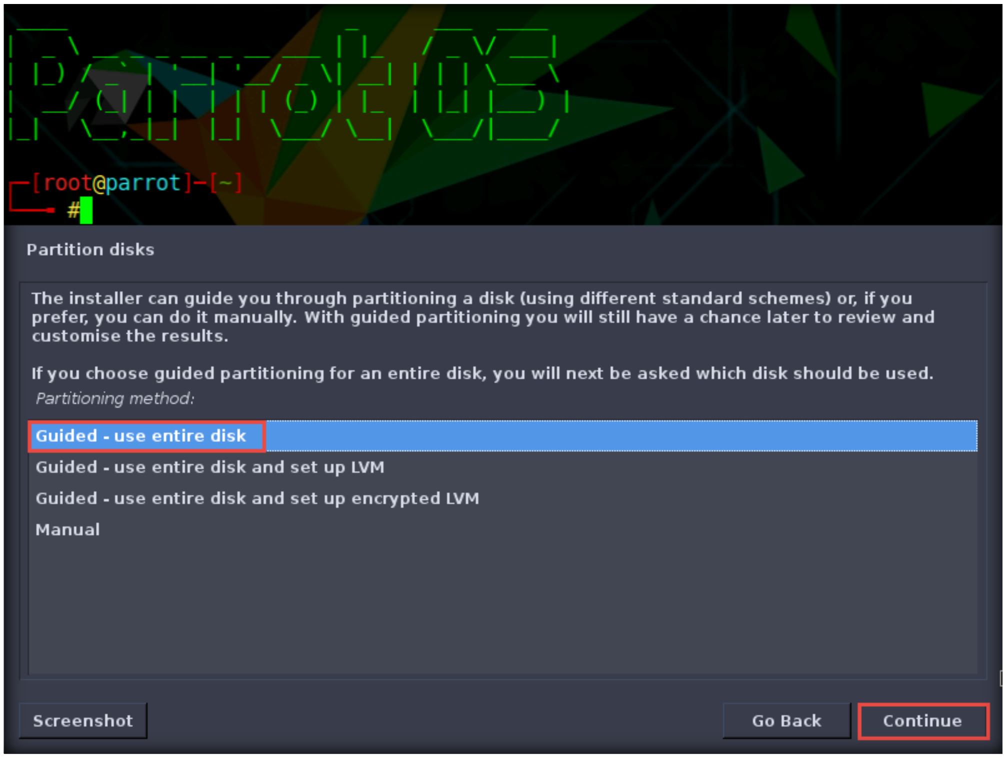
Configure the clock

If the desired time zone is not listed, then please go back to the step "Choose language" and select a country that uses the desired time zone (the country where you live or are located).

*Select your time zone:*

- Eastern
- Central
- Mountain
- Pacific
- Alaska
- Hawaii
- Arizona
- East Indiana
- Samoa

23. In the **Partition disks** section, choose **Guided - use entire disk** under **Partitioning method** and click **Continue**.



Partition disks

The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.

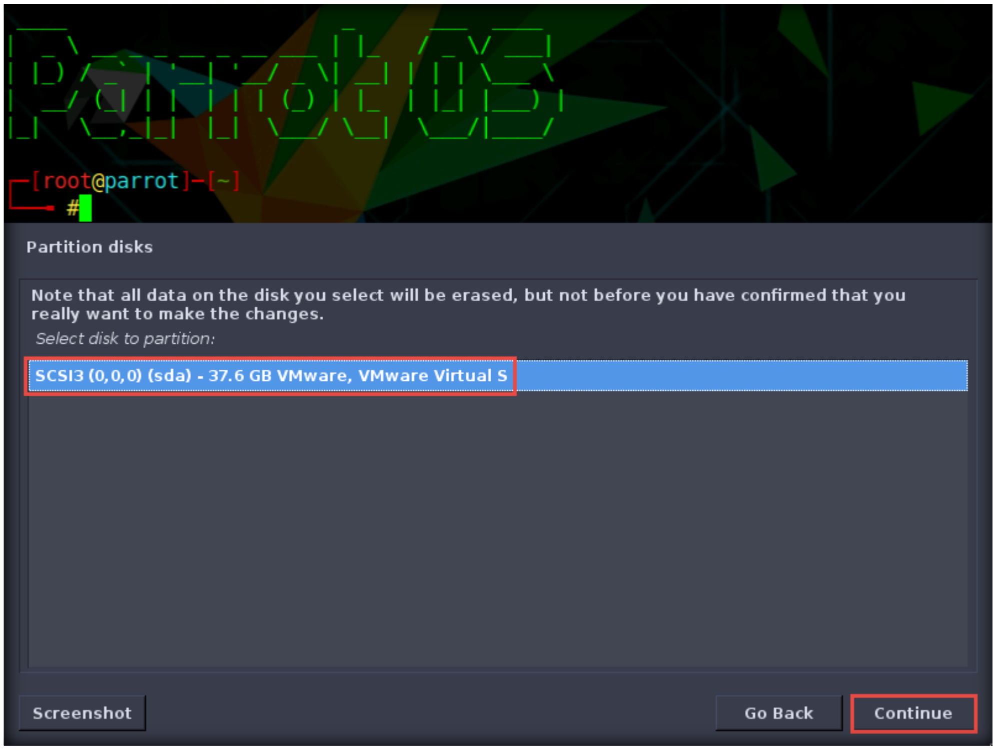
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.

Partitioning method:

- Guided - use entire disk
- Guided - use entire disk and set up LVM
- Guided - use entire disk and set up encrypted LVM
- Manual

24. Another **Partition disks** section appears; select the default disk and click **Continue**.

**Note:** The size of the disk (here, **37.6 GB**) may vary in your lab environment.



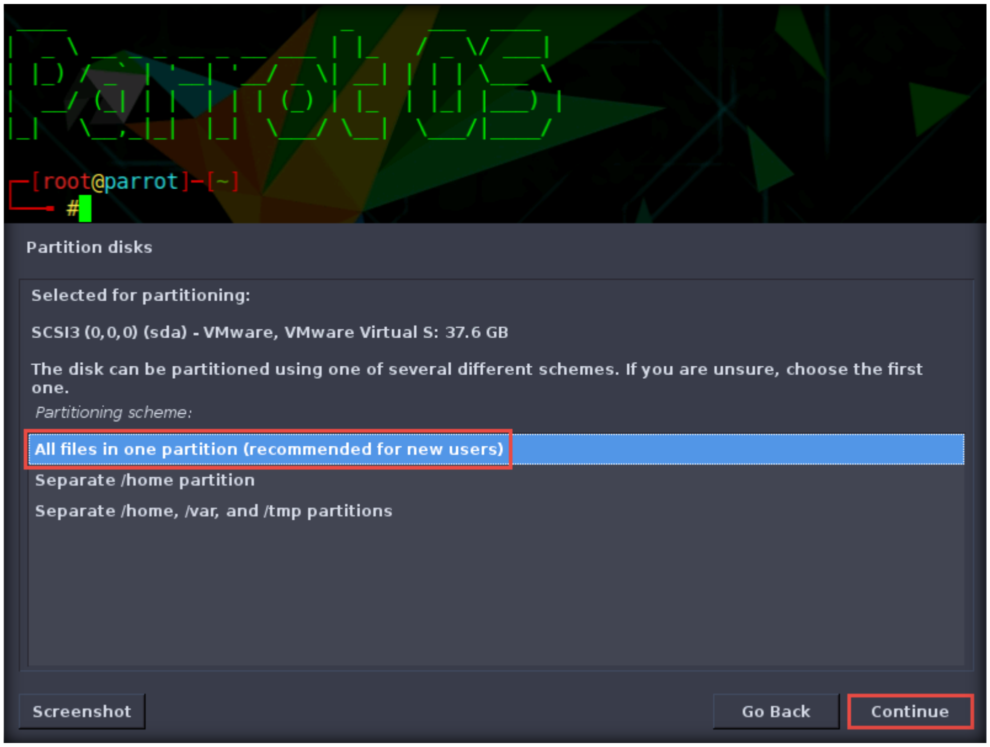
Partition disks

Note that all data on the disk you select will be erased, but not before you have confirmed that you really want to make the changes.

Select disk to partition:

- SCSI3 (0,0,0) (sda) - 37.6 GB VMware, VMware Virtual S

25. In the next **Partition disks** section, choose **All files in one partition (recommended for new users)** under **Partitioning scheme** and click **Continue**.



Partition disks

Selected for partitioning:

SCSI3 (0,0,0) (sda) - VMware, VMware Virtual S: 37.6 GB

The disk can be partitioned using one of several different schemes. If you are unsure, choose the first one.

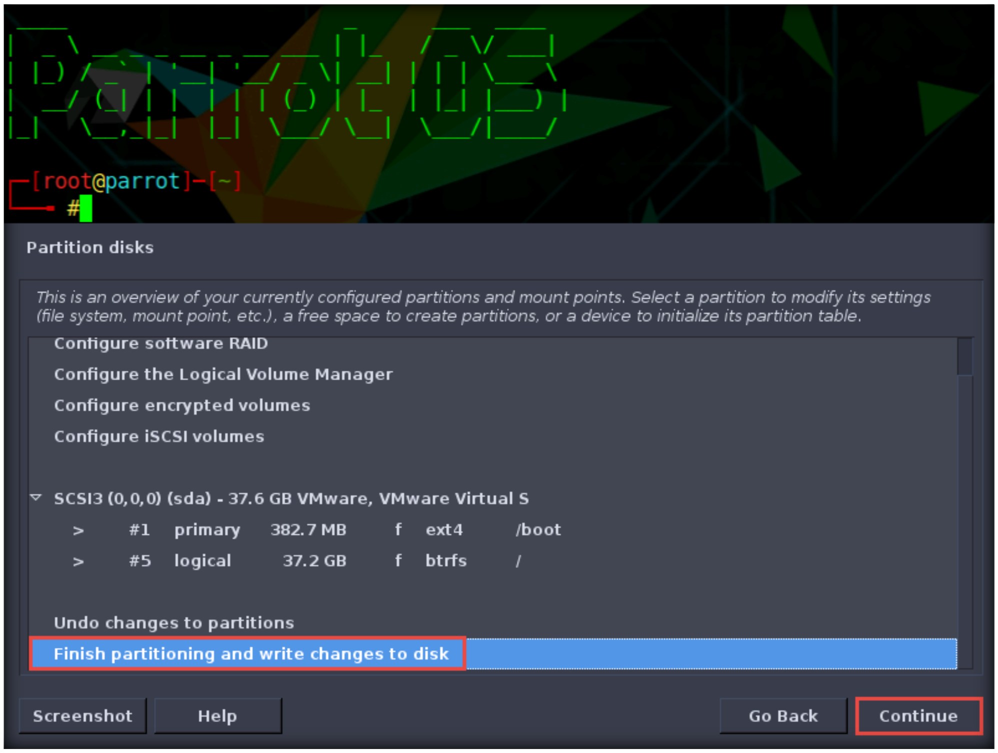
*Partitioning scheme:*

All files in one partition (recommended for new users)

Separate /home partition

Separate /home, /var, and /tmp partitions

26. The next **Partition disks** section displays an overview of your currently configured partitions. Verify the configuration and choose **Finish partitioning and write changes to disk**. Then, click **Continue**.



Partition disks

*This is an overview of your currently configured partitions and mount points. Select a partition to modify its settings (file system, mount point, etc.), a free space to create partitions, or a device to initialize its partition table.*

Configure software RAID

Configure the Logical Volume Manager

Configure encrypted volumes

Configure iSCSI volumes

SCSI3 (0,0,0) (sda) - 37.6 GB VMware, VMware Virtual S

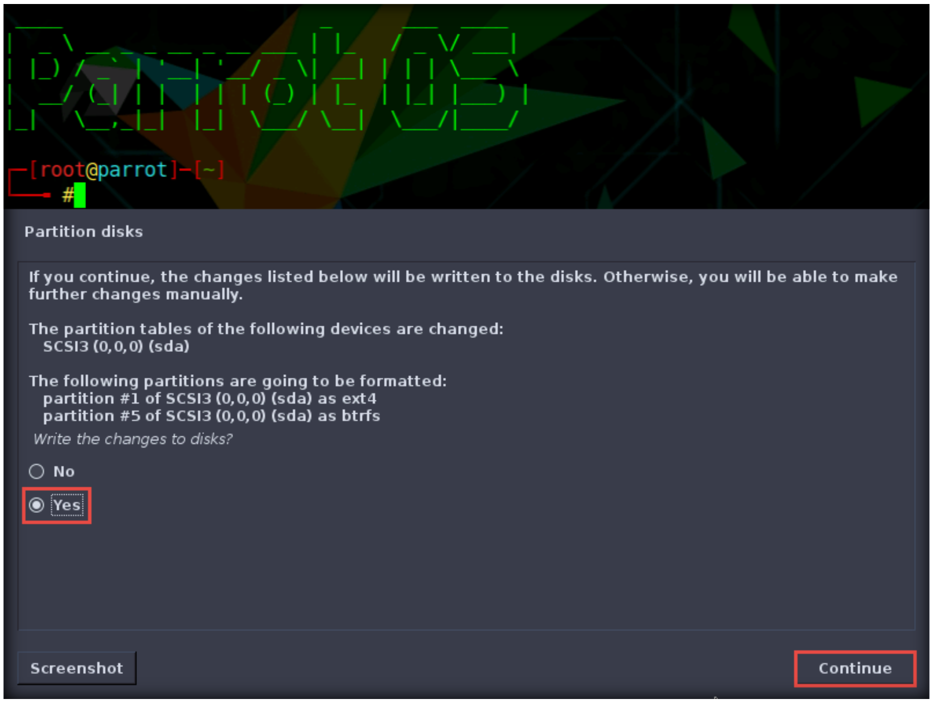
```
>    #1   primary   382.7 MB   f   ext4    /boot
>    #5   logical    37.2 GB   f   btrfs   /
```

Undo changes to partitions

Finish partitioning and write changes to disk

27. In the next **Partition disks** section, under **Do you want to return to the partitioning menu?**, select the **No** radio button and click **Continue**.

28. A final **Partition disks** section appears, stating that the changes will be written to the disk; select **Yes** and click **Continue**.



Partition disks

If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.

The partition tables of the following devices are changed:
SCSI3 (0,0,0) (sda)

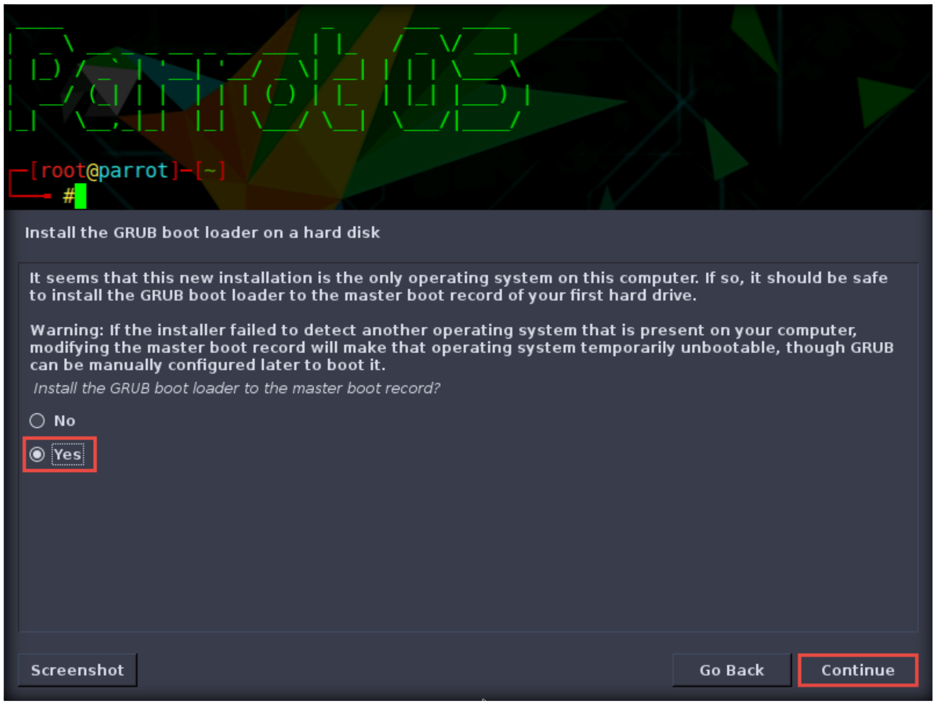
The following partitions are going to be formatted:
partition #1 of SCSI3 (0,0,0) (sda) as ext4
partition #5 of SCSI3 (0,0,0) (sda) as btrfs

*Write the changes to disks?*

○ No
● Yes

29. System installation will take some time.

30. In the **Install the GRUB boot loader on a hard disk** section, select the **Yes** radio button in order to install the GRUB boot loader to the master boot record; click **Continue**.



Install the GRUB boot loader on a hard disk

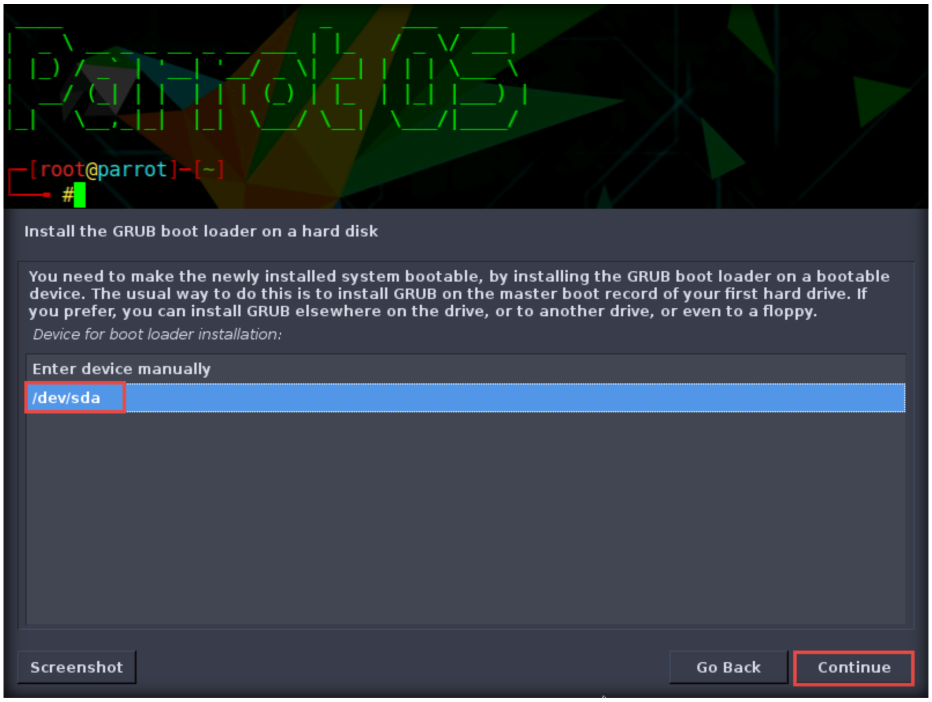
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.

Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.

*Install the GRUB boot loader to the master boot record?*

○ No
● Yes

31. Select the available device in **Device for boot loader installation** (here, **/dev/sda**) and click **Continue**. Wait until the GRUB boot loader is installed.



```
┌─[root@parrot]─[~]
└──╼ #
```

Install the GRUB boot loader on a hard disk

You need to make the newly installed system bootable, by installing the GRUB boot loader on a bootable device. The usual way to do this is to install GRUB on the master boot record of your first hard drive. If you prefer, you can install GRUB elsewhere on the drive, or to another drive, or even to a floppy.

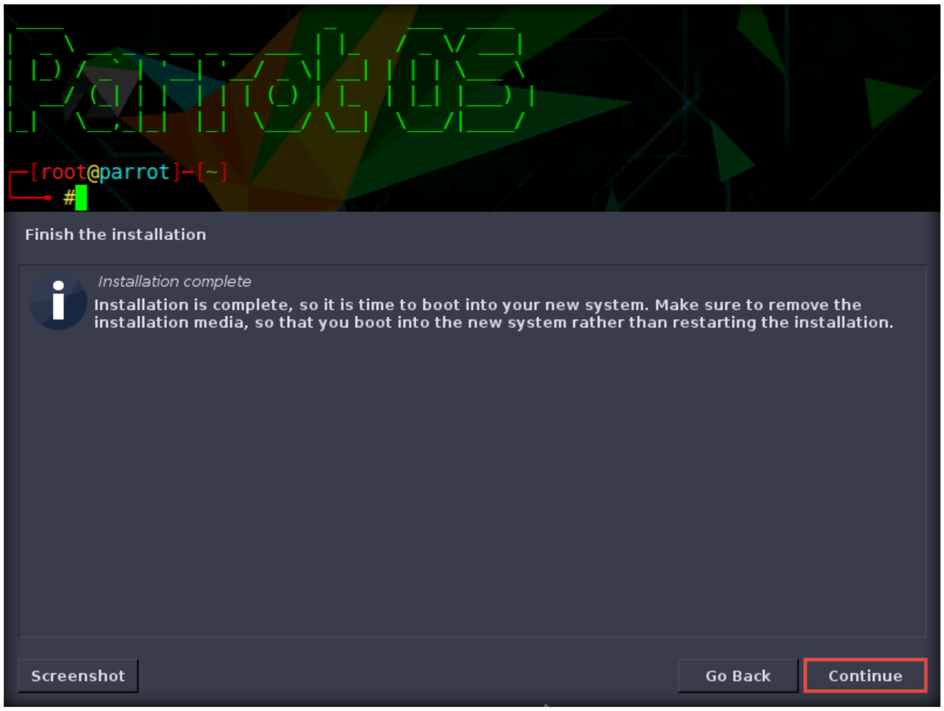
*Device for boot loader installation:*

Enter device manually

/dev/sda

32. Wait until the partitions are formatted and the operating system is installed.

33. It takes some time for the installation to complete. Once it has completed, click **Continue** in the **Finish the installation** section.



```
┌─[root@parrot]─[~]
└──╼ #
```

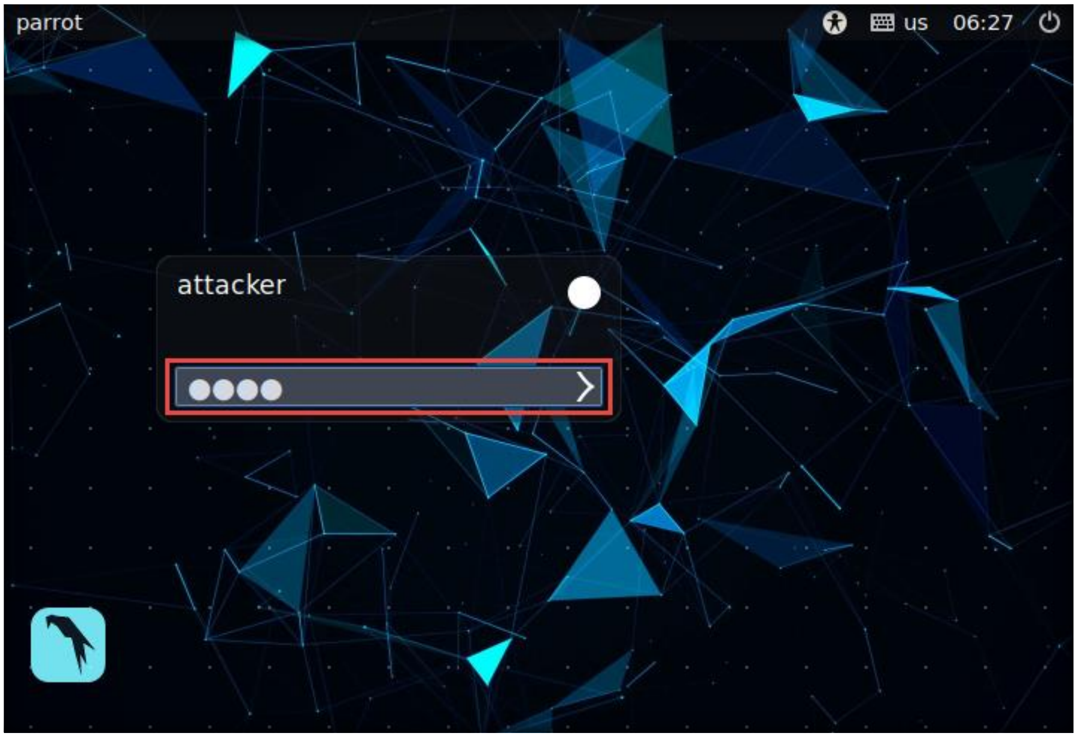
Finish the installation

*Installation complete*

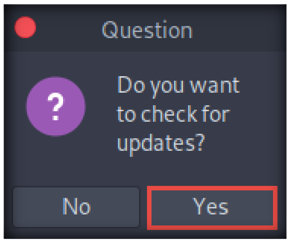
Installation is complete, so it is time to boot into your new system. Make sure to remove the installation media, so that you boot into the new system rather than restarting the installation.

34. Once the installation has finished, the machine will reboot.

35. After the reboot, the **attacker** username will be selected by default on the login screen. Enter password as **toor** in the **Password** field and press **Enter** to log in to the machine.

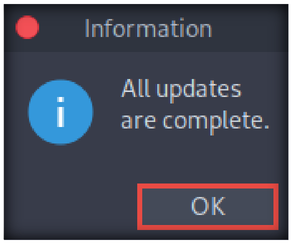

parrot
us
06:27
attacker
●●●●

36. A **Question** pop-up window appears; select **Yes** to update.


Question
No
Yes

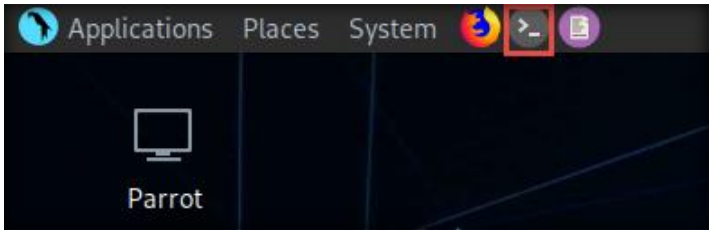
Do you want to check for updates?

37. A **Information** pop-up window appears; select **OK**.

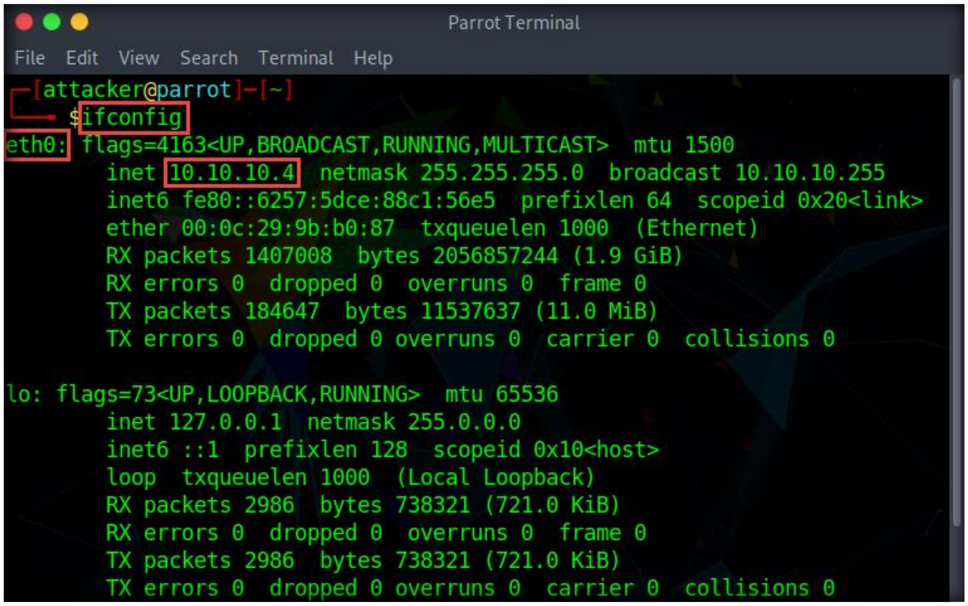

Information
OK

All updates are complete.

38. Click the **MATE Terminal** icon at the top of the **Desktop** window to open a **Terminal** window.


Applications
Places
System
Parrot

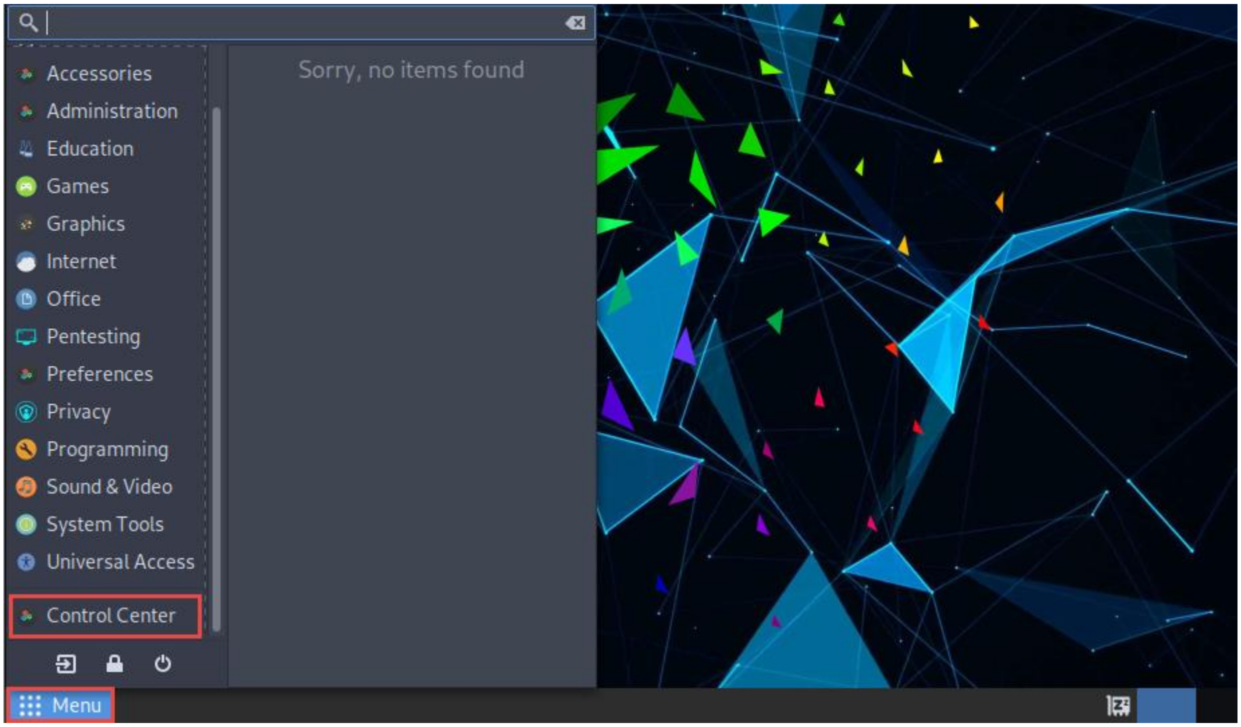
39. Now, verify the configured network adapter setting of the virtual machine. In the **Parrot Terminal** window, type **ifconfig** and press **Enter** to check the network adapter—here it is **eth0** (this might differ in your lab environment). Close the terminal window after noting the adapter.



Parrot Terminal
File Edit View Search Terminal Help

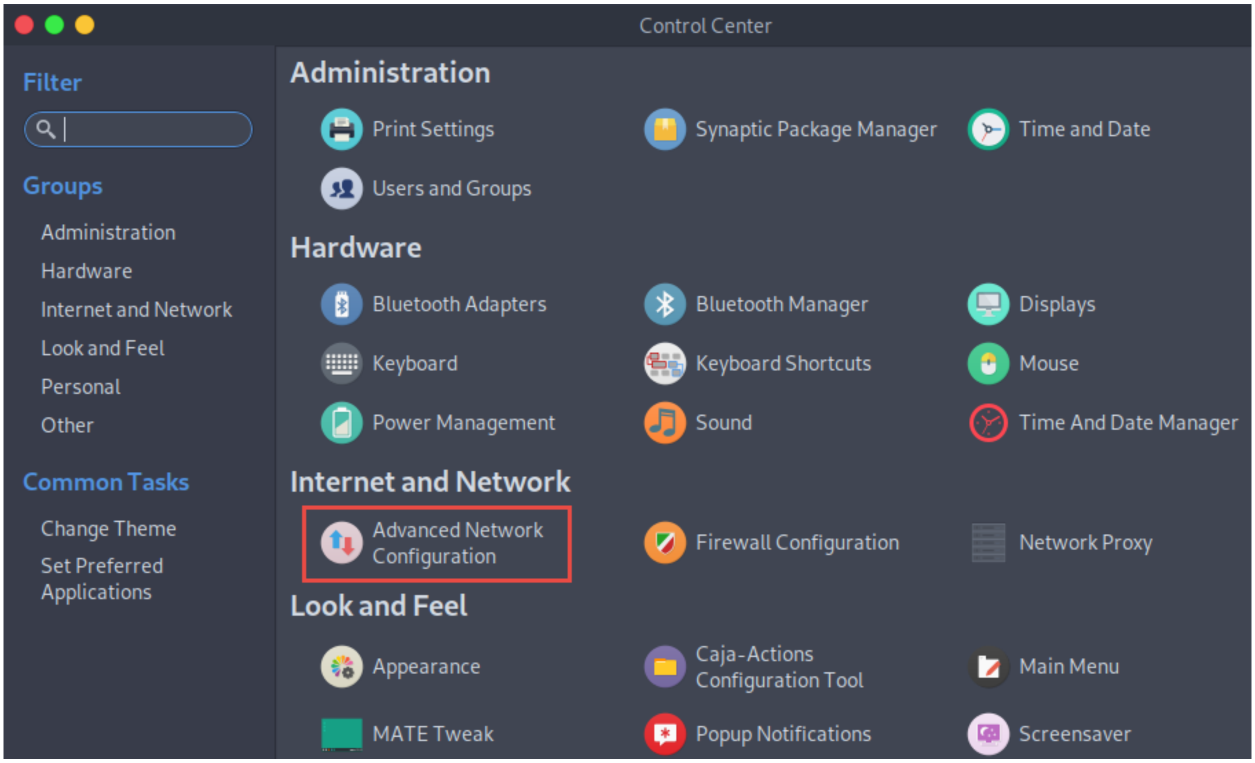
```
┌─[attacker@parrot]─[~]
└──╼ $ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.10.10.4  netmask 255.255.255.0  broadcast 10.10.10.255
        inet6 fe80::6257:5dce:88c1:56e5  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:9b:b0:87  txqueuelen 1000  (Ethernet)
        RX packets 1407008  bytes 2056857244 (1.9 GiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 184647  bytes 11537637 (11.0 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 2986  bytes 738321 (721.0 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 2986  bytes 738321 (721.0 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

40. Since this adapter IP address has been assigned through DHCP, now, we need to configure the network adapter to static. To do this, navigate to **Menu** in the bottom-left corner of **Desktop** and click **Control Center**.

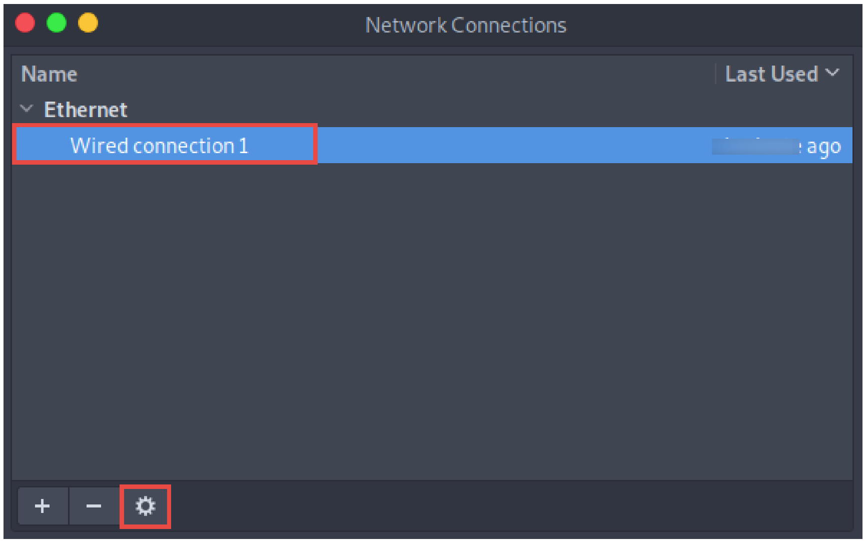


Sorry, no items found
Accessories
Administration
Education
Games
Graphics
Internet
Office
Pentesting
Preferences
Privacy
Programming
Sound & Video
System Tools
Universal Access
Control Center
Menu

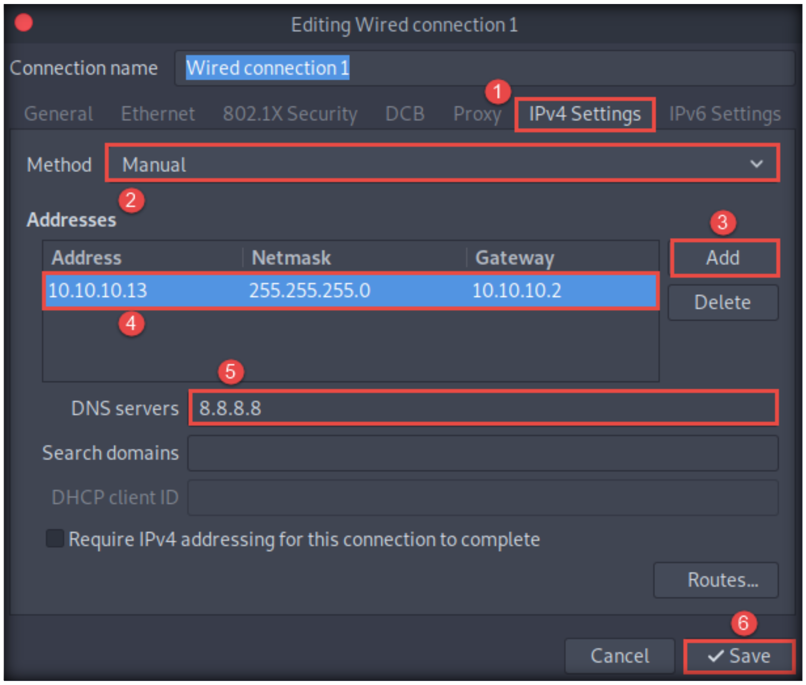
41. The **Control Center** window appears; click **Advanced Network Configuration** under the **Internet and Network** section.


Control Center
Filter
Groups
Administration
Hardware
Internet and Network
Look and Feel
Personal
Other
Common Tasks
Change Theme
Set Preferred Applications
Administration
Print Settings
Synaptic Package Manager
Time and Date
Users and Groups
Hardware
Bluetooth Adapters
Bluetooth Manager
Displays
Keyboard
Keyboard Shortcuts
Mouse
Power Management
Sound
Time And Date Manager
Internet and Network
Advanced Network Configuration
Firewall Configuration
Network Proxy
Look and Feel
Appearance
Caja-Actions Configuration Tool
Main Menu
MATE Tweak
Popup Notifications
Screensaver

42. The **Network Connections** window appears. Select **Wired connection 1** and click the **Settings** icon.


Network Connections
Name
Last Used
Ethernet
Wired connection 1
[redacted] ago
+
−

43. In the **Editing Wired connection 1** window, navigate to the **IPv4 Settings** tab. Select the **Manual** option from the **Method** drop-down box. Under the **Addresses** section, click the **Add** button and add **10.10.10.13**, **255.255.255.0**, **10.10.10.2** under the **Address**, **Netmask**, and **Gateway** columns. Type **8.8.8.8** in the **DNS servers** box and click **Save**.



Connection name: Wired connection 1

Method: Manual

Addresses

| Address | Netmask | Gateway |
|---|---|---|
| 10.10.10.13 | 255.255.255.0 | 10.10.10.2 |

DNS servers: 8.8.8.8

Search domains:

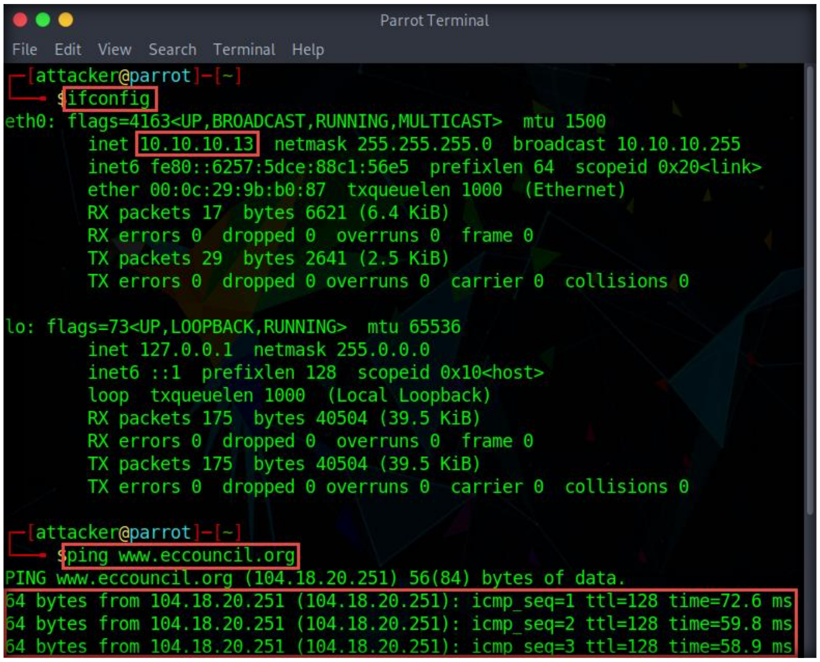
DHCP client ID:

☐ Require IPv4 addressing for this connection to complete

44. Close all windows and **Reboot** the virtual machine to enable the setting.

45. Once the machine has restarted, log in to the machine and open **terminal**.

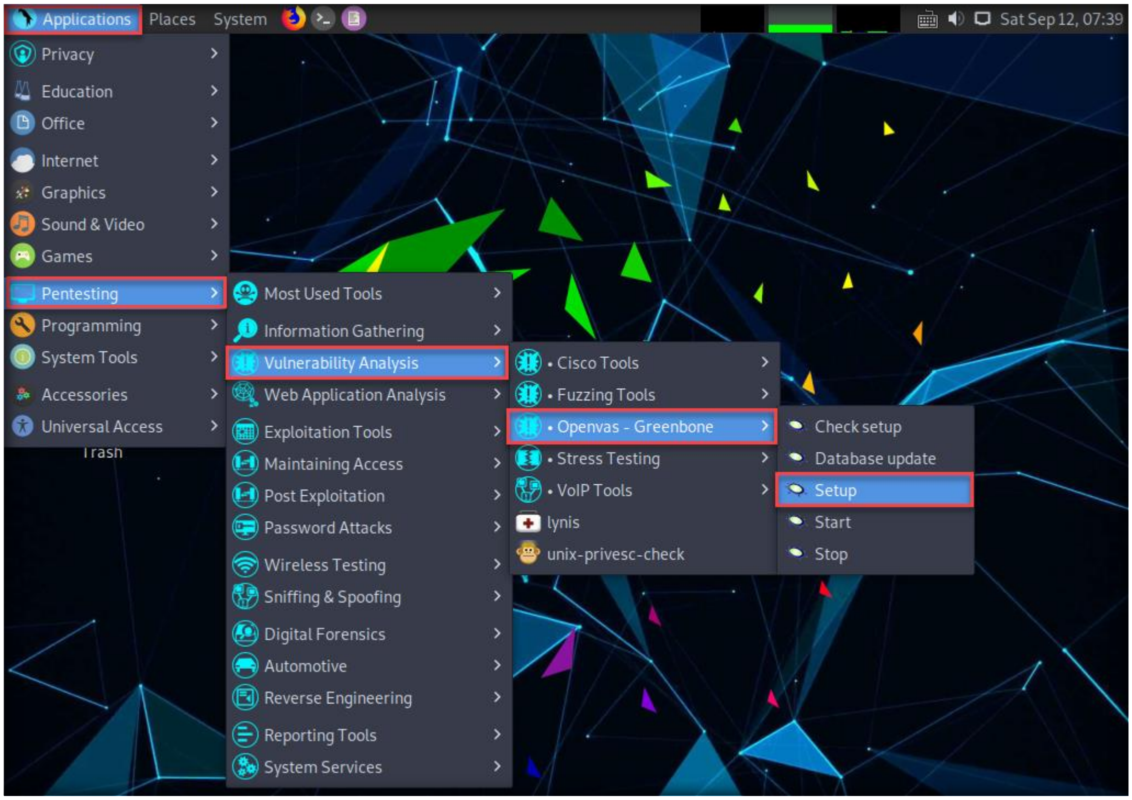
46. Type **ifconfig** and press **Enter** to verify the configured IP address. Then, type **ping www.eccouncil.org** to check the Internet connectivity.



```
┌─[attacker@parrot]─[~]
└──╼ $ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.10.10.13  netmask 255.255.255.0  broadcast 10.10.10.255
        inet6 fe80::6257:5dce:88c1:56e5  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:9b:b0:87  txqueuelen 1000  (Ethernet)
        RX packets 17  bytes 6621 (6.4 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 29  bytes 2641 (2.5 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 175  bytes 40504 (39.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 175  bytes 40504 (39.5 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

┌─[attacker@parrot]─[~]
└──╼ $ping www.eccouncil.org
PING www.eccouncil.org (104.18.20.251) 56(84) bytes of data.
64 bytes from 104.18.20.251 (104.18.20.251): icmp_seq=1 ttl=128 time=72.6 ms
64 bytes from 104.18.20.251 (104.18.20.251): icmp_seq=2 ttl=128 time=59.8 ms
64 bytes from 104.18.20.251 (104.18.20.251): icmp_seq=3 ttl=128 time=58.9 ms
```

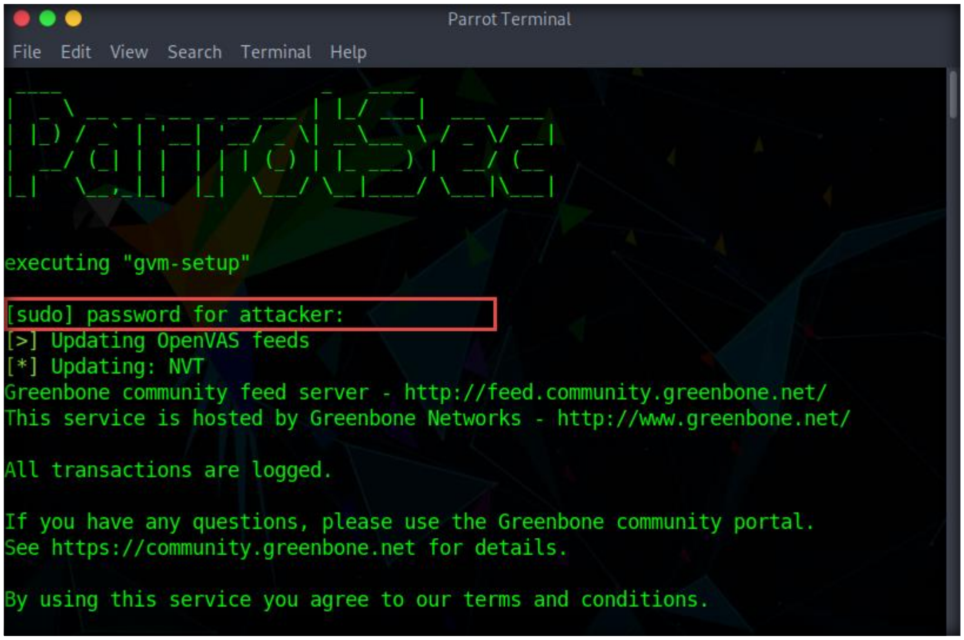
47. Press **CTRL+C** and close the terminal window.

48. Click the **Applications** menu and navigate to **Pentesting → Vulnerability Analysis → Openvas - Greenbone → Setup**.


Applications
Places
System
Sat Sep 12, 07:39
Privacy
Education
Office
Internet
Graphics
Sound & Video
Games
Pentesting
Programming
System Tools
Accessories
Universal Access
Trash
Most Used Tools
Information Gathering
Vulnerability Analysis
Web Application Analysis
Exploitation Tools
Maintaining Access
Post Exploitation
Password Attacks
Wireless Testing
Sniffing & Spoofing
Digital Forensics
Automotive
Reverse Engineering
Reporting Tools
System Services
• Cisco Tools
• Fuzzing Tools
• Openvas - Greenbone
• Stress Testing
• VoIP Tools
lynis
unix-privesc-check
Check setup
Database update
Setup
Start
Stop

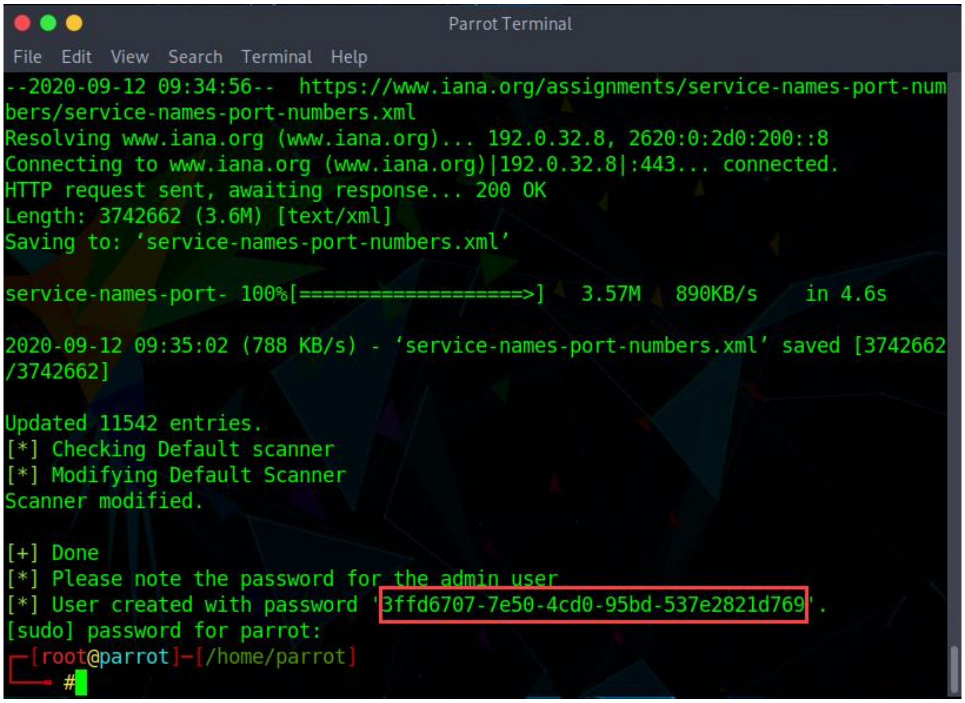
49. The **Parrot Terminal** window appears. In the **[sudo] password for attacker** field, type **toor** as a password and press **Enter**.

**Note**: The password that you type will not be visible.


Parrot Terminal
File
Edit
View
Search
Terminal
Help

```
 ____                      _   ____
|  _ \ __ _ _ __ _ __ ___ | |_/ ___|  ___  ___
| |_) / _` | '__| '__/ _ \| __\___ \ / _ \/ __|
|  __/ (_| | |  | | | (_) | |_ ___) |  __/ (__
|_|   \__,_|_|  |_|  \___/ \__|____/ \___|\___|


executing "gvm-setup"

[sudo] password for attacker:
[>] Updating OpenVAS feeds
[*] Updating: NVT
Greenbone community feed server - http://feed.community.greenbone.net/
This service is hosted by Greenbone Networks - http://www.greenbone.net/

All transactions are logged.

If you have any questions, please use the Greenbone community portal.
See https://community.greenbone.net for details.

By using this service you agree to our terms and conditions.
```

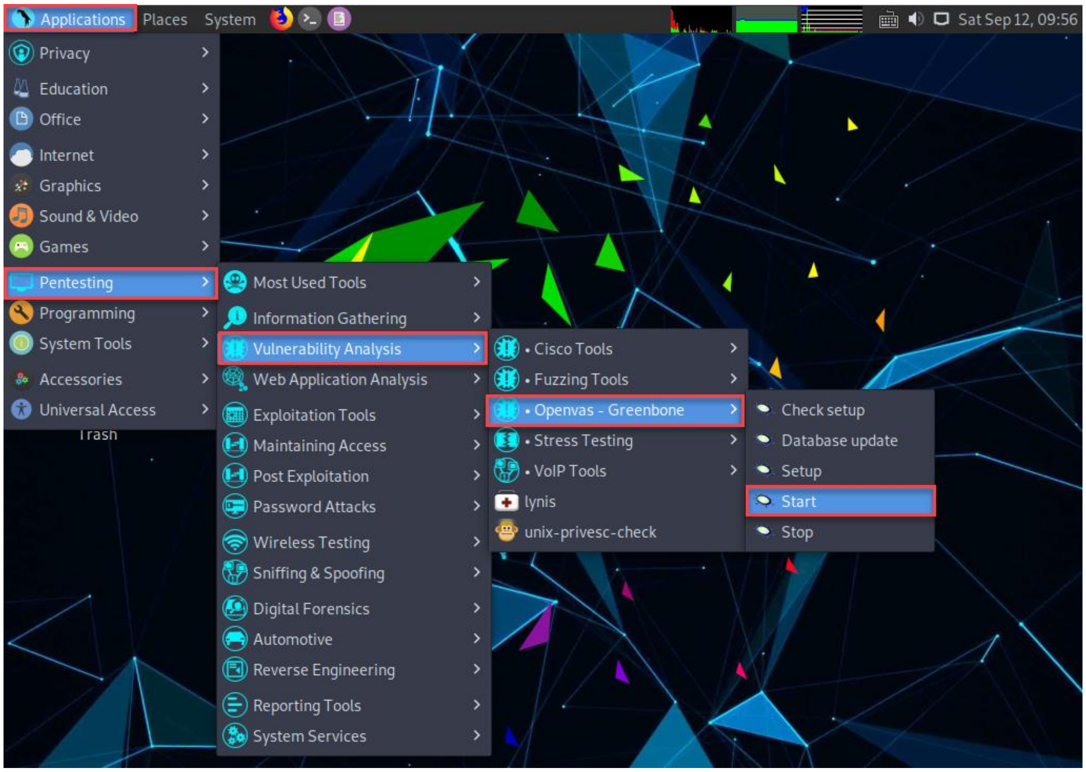
50. It will start the OpenVAS application installation. This will take some time to complete, as it will synchronize the databases and update the plugins. Take note of the password displayed.



Parrot Terminal
File Edit View Search Terminal Help

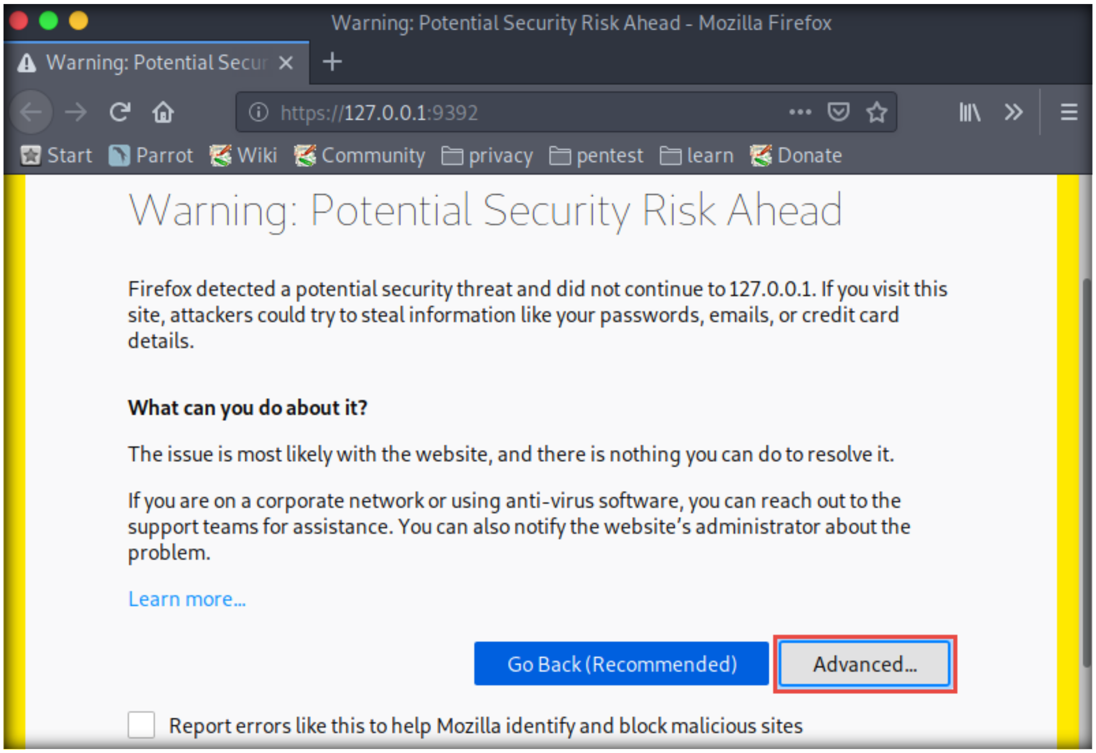
```
--2020-09-12 09:34:56--  https://www.iana.org/assignments/service-names-port-num
bers/service-names-port-numbers.xml
Resolving www.iana.org (www.iana.org)... 192.0.32.8, 2620:0:2d0:200::8
Connecting to www.iana.org (www.iana.org)|192.0.32.8|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3742662 (3.6M) [text/xml]
Saving to: 'service-names-port-numbers.xml'

service-names-port- 100%[===================>]   3.57M   890KB/s    in 4.6s

2020-09-12 09:35:02 (788 KB/s) - 'service-names-port-numbers.xml' saved [3742662
/3742662]

Updated 11542 entries.
[*] Checking Default scanner
[*] Modifying Default Scanner
Scanner modified.

[+] Done
[*] Please note the password for the admin user
[*] User created with password '3ffd6707-7e50-4cd0-95bd-537e2821d769'.
[sudo] password for parrot:
┌─[root@parrot]─[/home/parrot]
└──╼ #
```

51. After the installation is complete, go to **Applications** → **Pentesting** → **Vulnerability Analysis** → **Openvas – Greenbone** and click **Start**. The **Parrot Terminal** window appears, for **[sudo] password for attacker**, type **toor** as a password and press **Enter**.



Applications
Places
System
Sat Sep 12, 09:56
Privacy
Education
Office
Internet
Graphics
Sound & Video
Games
Pentesting
Programming
System Tools
Accessories
Universal Access
Trash
Most Used Tools
Information Gathering
Vulnerability Analysis
Web Application Analysis
Exploitation Tools
Maintaining Access
Post Exploitation
Password Attacks
Wireless Testing
Sniffing & Spoofing
Digital Forensics
Automotive
Reverse Engineering
Reporting Tools
System Services
• Cisco Tools
• Fuzzing Tools
• Openvas - Greenbone
• Stress Testing
• VoIP Tools
lynis
unix-privesc-check
Check setup
Database update
Setup
Start
Stop

52. After the OpenVAS start up is complete, open a **Firefox** web browser and type **https://127.0.0.1:9392** in the URL field and press **Enter**. Click **Advanced**.



Warning: Potential Security Risk Ahead - Mozilla Firefox
Warning: Potential Secur
https://127.0.0.1:9392
Start
Parrot
Wiki
Community
privacy
pentest
learn
Donate

Warning: Potential Security Risk Ahead

Firefox detected a potential security threat and did not continue to 127.0.0.1. If you visit this site, attackers could try to steal information like your passwords, emails, or credit card details.

**What can you do about it?**

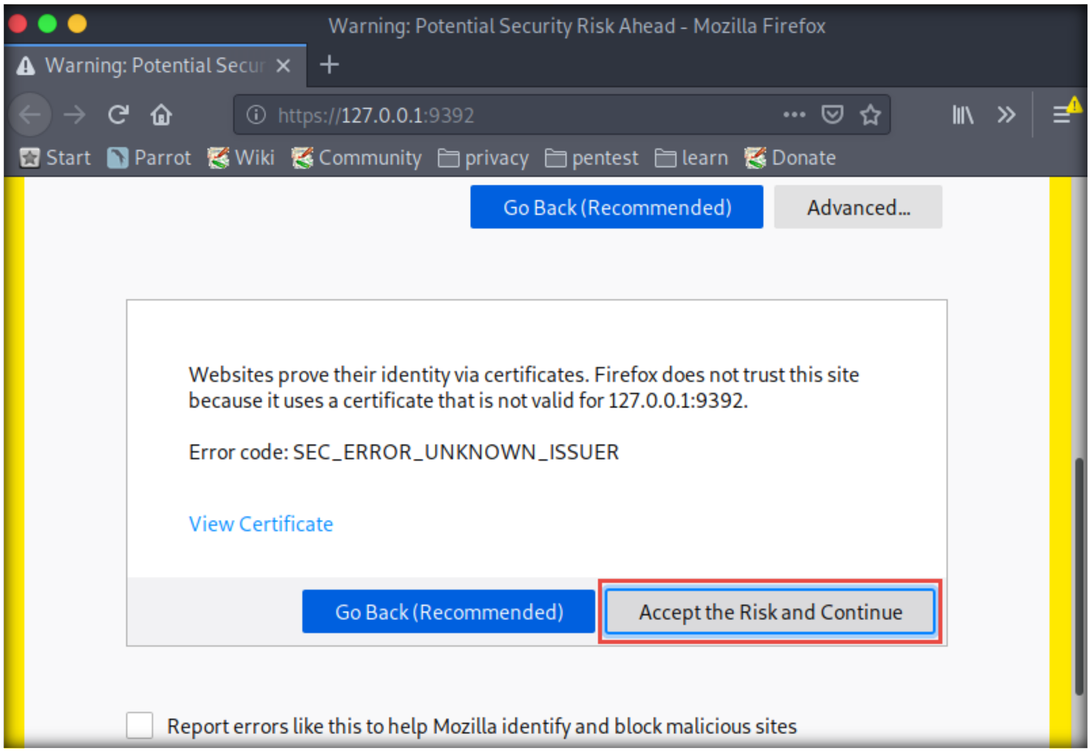
The issue is most likely with the website, and there is nothing you can do to resolve it.

If you are on a corporate network or using anti-virus software, you can reach out to the support teams for assistance. You can also notify the website's administrator about the problem.

Learn more...
Go Back (Recommended)
Advanced...

☐ Report errors like this to help Mozilla identify and block malicious sites

53. Scroll down and click **Accept the Risk and Continue**.



Warning: Potential Security Risk Ahead - Mozilla Firefox
Warning: Potential Secur
https://127.0.0.1:9392
Start
Parrot
Wiki
Community
privacy
pentest
learn
Donate
Go Back (Recommended)
Advanced...

Websites prove their identity via certificates. Firefox does not trust this site because it uses a certificate that is not valid for 127.0.0.1:9392.

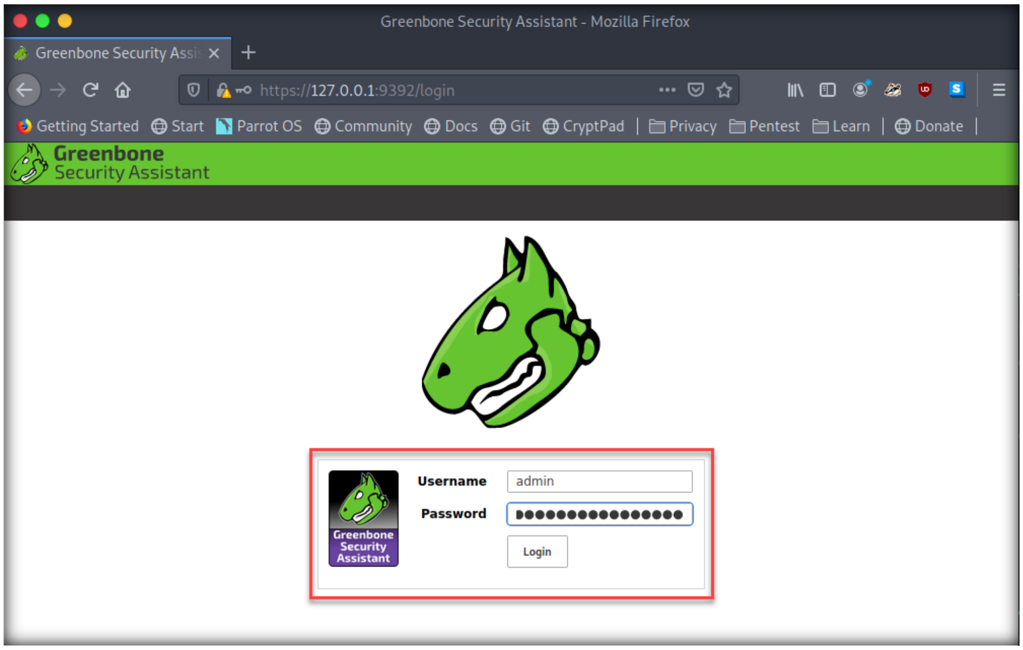
Error code: SEC_ERROR_UNKNOWN_ISSUER

View Certificate
Go Back (Recommended)
Accept the Risk and Continue

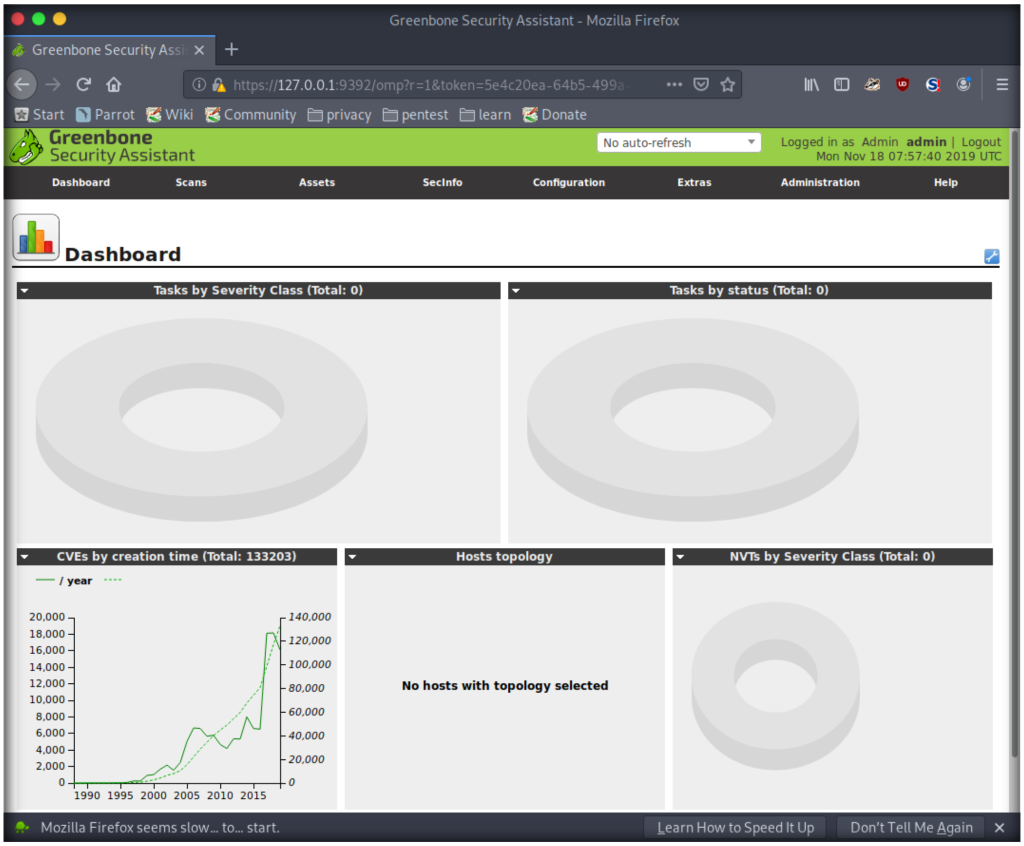
☐ Report errors like this to help Mozilla identify and block malicious sites

54. The **OpenVAS login** page appears; log in as admin and use the password that you have noted in the step 50 and click the **Login** button.

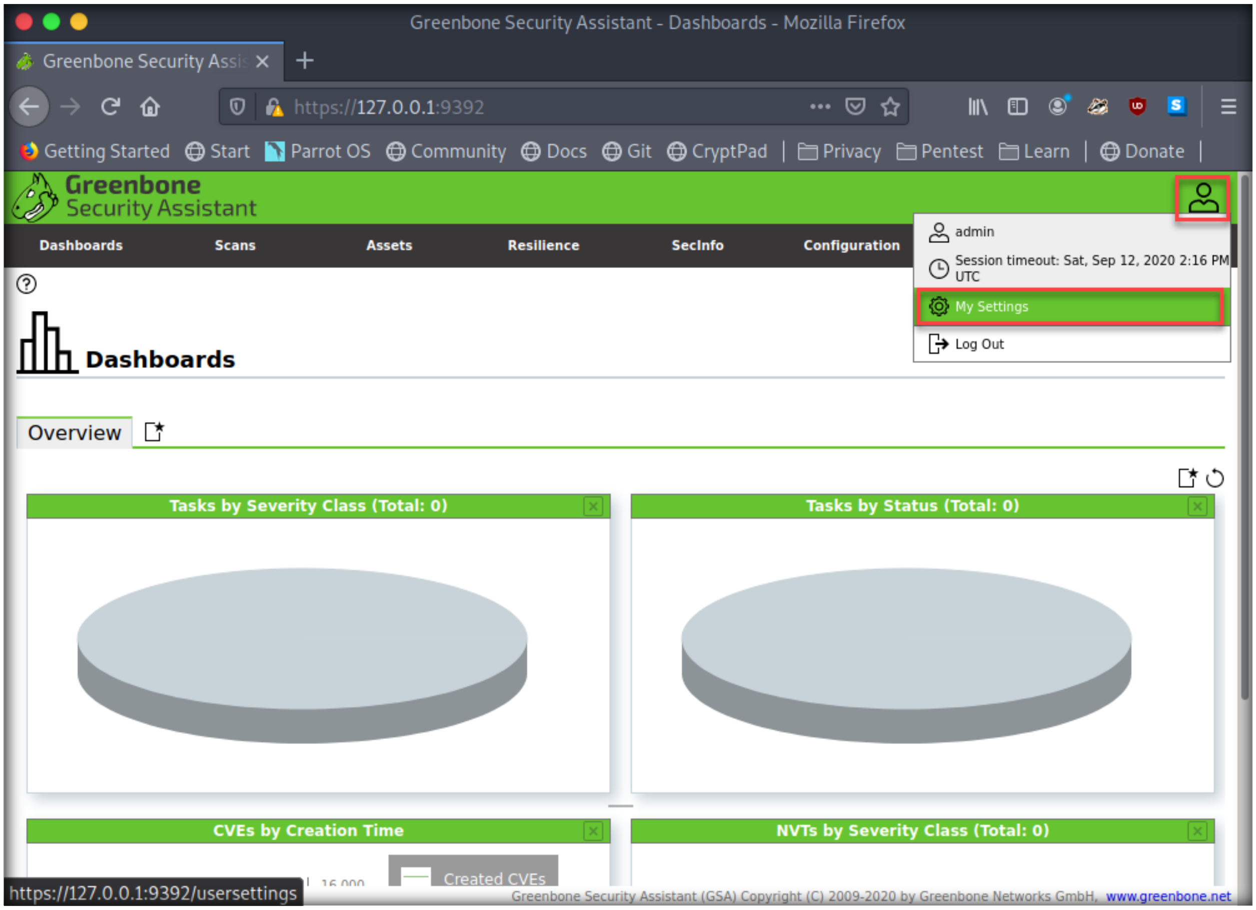
    **Note**: If **Would you like Firefox to save this login for https://127.0.0.1:9392?** pop-up appears in the top section of the browser window, click **Don't Save**.


Greenbone Security Assistant - Mozilla Firefox
Greenbone Security Assi
https://127.0.0.1:9392/login
Getting Started
Start
Parrot OS
Community
Docs
Git
CryptPad
Privacy
Pentest
Learn
Donate
Greenbone Security Assistant
Username
admin
Password
Login

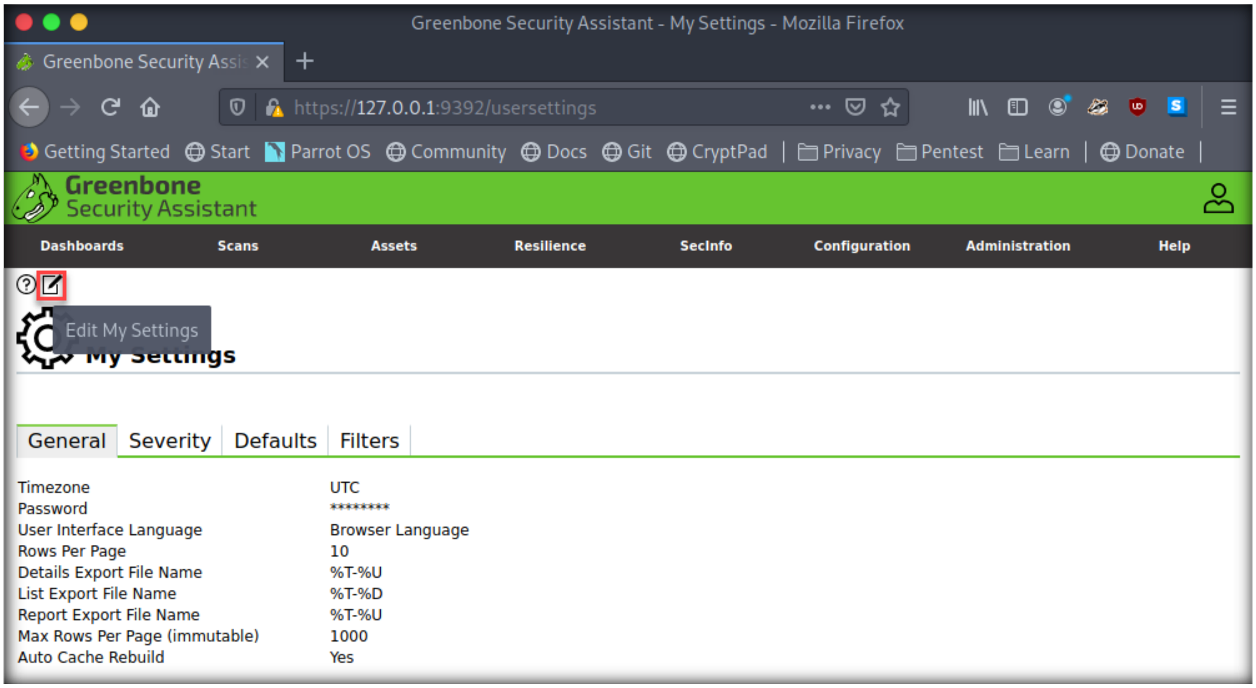
55. The **OpenVAS Dashboard** appears, as shown in the screenshot.


Greenbone Security Assistant - Mozilla Firefox
Greenbone Security Assi
https://127.0.0.1:9392/omp?r=1&token=5e4c20ea-64b5-499a
Start
Parrot
Wiki
Community
privacy
pentest
learn
Donate
Greenbone Security Assistant
No auto-refresh
Logged in as Admin admin | Logout
Mon Nov 18 07:57:40 2019 UTC
Dashboard
Scans
Assets
SecInfo
Configuration
Extras
Administration
Help
Dashboard
Tasks by Severity Class (Total: 0)
Tasks by status (Total: 0)
CVEs by creation time (Total: 133203)
/ year
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1990
1995
2000
2005
2010
2015
Hosts topology
No hosts with topology selected
NVTs by Severity Class (Total: 0)
Mozilla Firefox seems slow... to... start.
Learn How to Speed It Up
Don't Tell Me Again

56. Now, click the user icon at the top-right corner and click on **My Settings**.

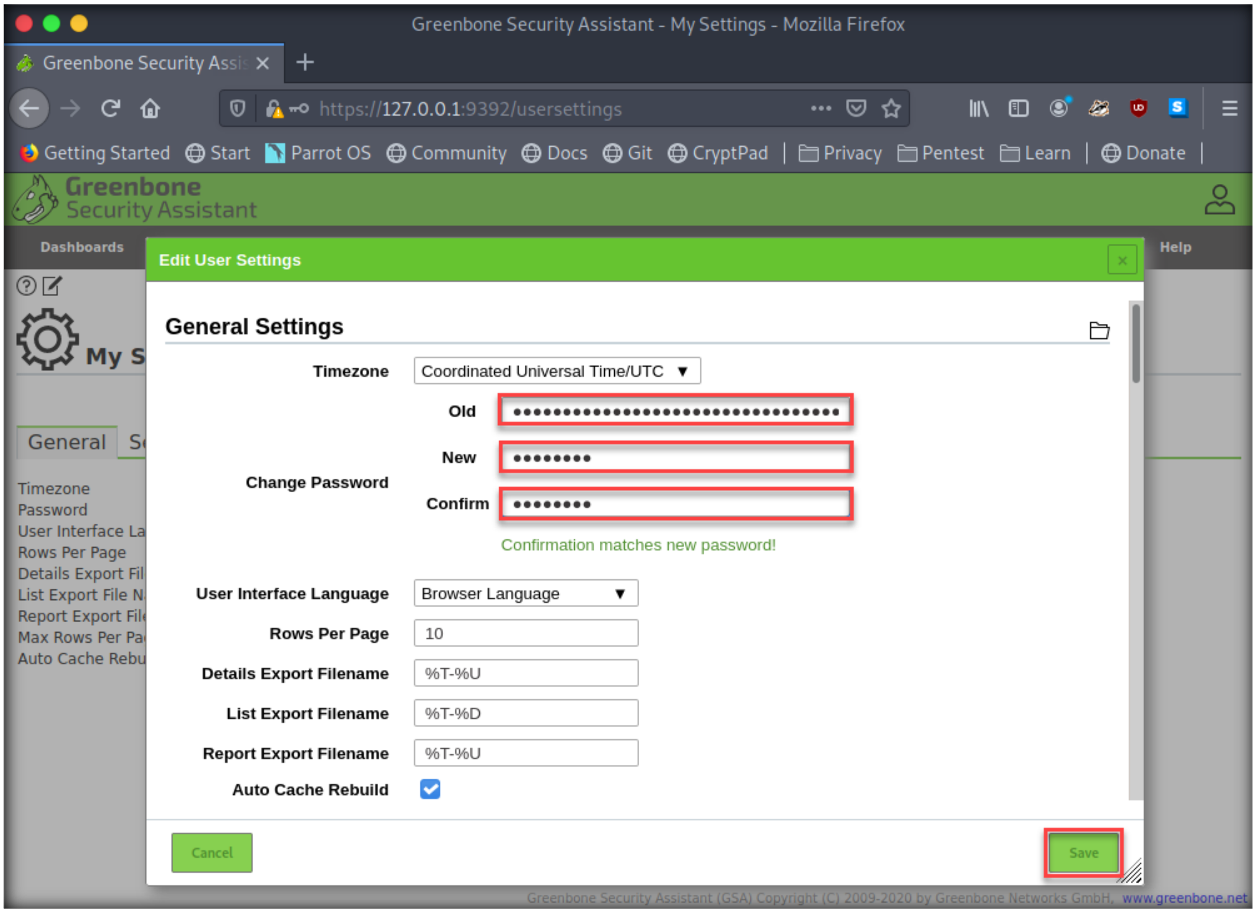

Greenbone Security Assistant - Dashboards - Mozilla Firefox
Greenbone Security Assis
https://127.0.0.1:9392
Getting Started
Start
Parrot OS
Community
Docs
Git
CryptPad
Privacy
Pentest
Learn
Donate
Greenbone Security Assistant
Dashboards
Scans
Assets
Resilience
SecInfo
Configuration
admin
Session timeout: Sat, Sep 12, 2020 2:16 PM UTC
My Settings
Log Out
Dashboards
Overview
Tasks by Severity Class (Total: 0)
Tasks by Status (Total: 0)
CVEs by Creation Time
NVTs by Severity Class (Total: 0)
16 000
Created CVEs
https://127.0.0.1:9392/usersettings
Greenbone Security Assistant (GSA) Copyright (C) 2009-2020 by Greenbone Networks GmbH, www.greenbone.net

57. Click on **Edit My Settings** icon.


Greenbone Security Assistant - My Settings - Mozilla Firefox
Greenbone Security Assis
https://127.0.0.1:9392/usersettings
Getting Started
Start
Parrot OS
Community
Docs
Git
CryptPad
Privacy
Pentest
Learn
Donate
Greenbone Security Assistant
Dashboards
Scans
Assets
Resilience
SecInfo
Configuration
Administration
Help
Edit My Settings
My Settings
General
Severity
Defaults
Filters

| | |
|---|---|
| Timezone | UTC |
| Password | ******** |
| User Interface Language | Browser Language |
| Rows Per Page | 10 |
| Details Export File Name | %T-%U |
| List Export File Name | %T-%D |
| Report Export File Name | %T-%U |
| Max Rows Per Page (immutable) | 1000 |
| Auto Cache Rebuild | Yes |

58. In the **Edit User Settings** window, type the old password and set **password** as the new password. Click **Save**. Next time, you can log on to the OpenVAS using **admin** and **password** for Username and Password.


Greenbone Security Assistant - My Settings - Mozilla Firefox
Greenbone Security Assi
https://127.0.0.1:9392/usersettings
Getting Started
Start
Parrot OS
Community
Docs
Git
CryptPad
Privacy
Pentest
Learn
Donate
Greenbone Security Assistant
Dashboards
Help
My S
General
Timezone
Password
User Interface La
Rows Per Page
Details Export Fil
List Export File N
Report Export Fil
Max Rows Per Pa
Auto Cache Rebu
Cancel
Save
Greenbone Security Assistant (GSA) Copyright (C) 2009-2020 by Greenbone Networks GmbH, www.greenbone.net

Edit User Settings

General Settings

Timezone: Coordinated Universal Time/UTC ▼

Change Password
Old: ••••••••••••••••••••••••••••••••••
New: •••••••••
Confirm: •••••••••
Confirmation matches new password!

User Interface Language: Browser Language ▼
Rows Per Page: 10
Details Export Filename: %T-%U
List Export Filename: %T-%D
Report Export Filename: %T-%U
Auto Cache Rebuild: ☑

59. OpenVAS is now set up; close all windows and shut down the virtual machine.

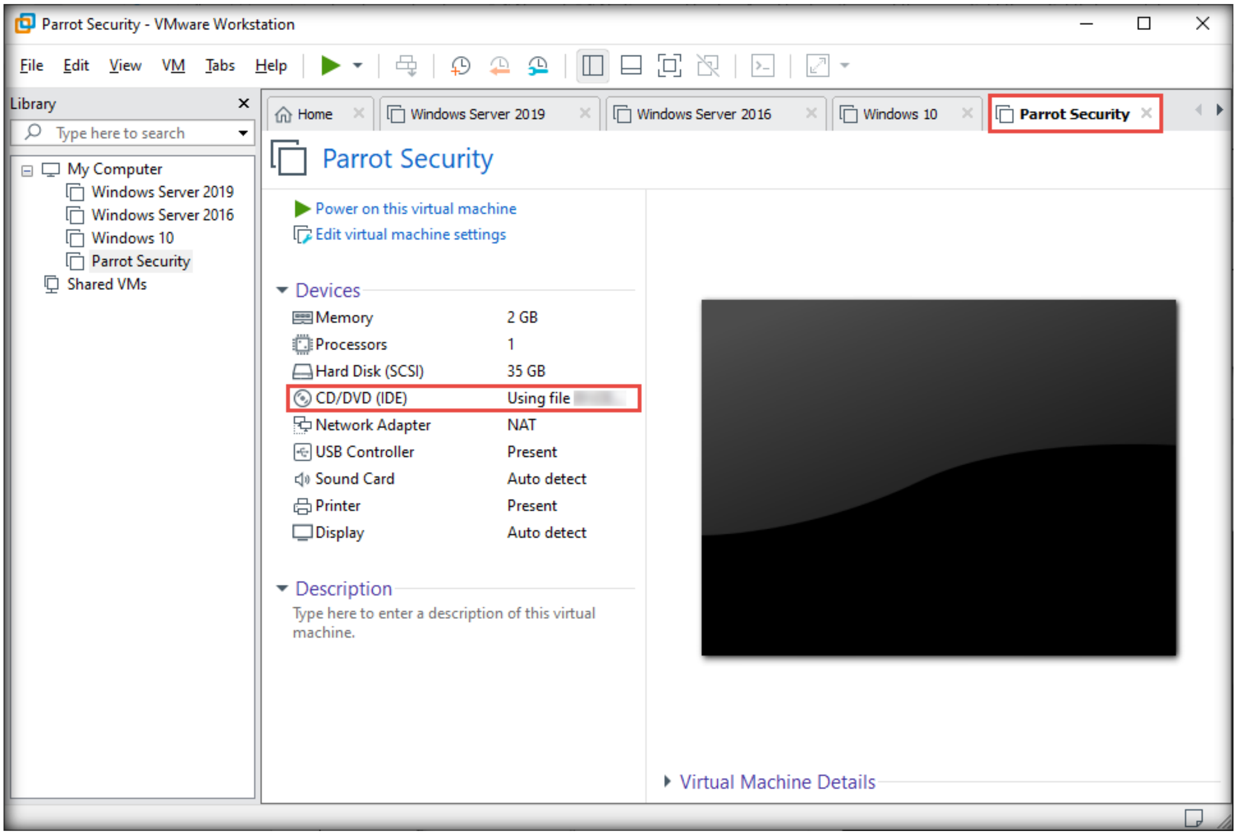
60. Ensure that the tools on the following list are installed on the **Parrot Security** virtual machine:

- theHarvester
- Unicornscan
- DNSRecon
- SNMP-check
- Enum4linux
- Yersinia
- arpspoof
- macof
- Skipfish
- sqlmap
- WAFW00F
- Weevely

**Note**: To check whether a tool is installed, type the tool's name in the **Terminal** window and press **Enter**; if the available tool options are displayed, then the given tool is installed on the machine.

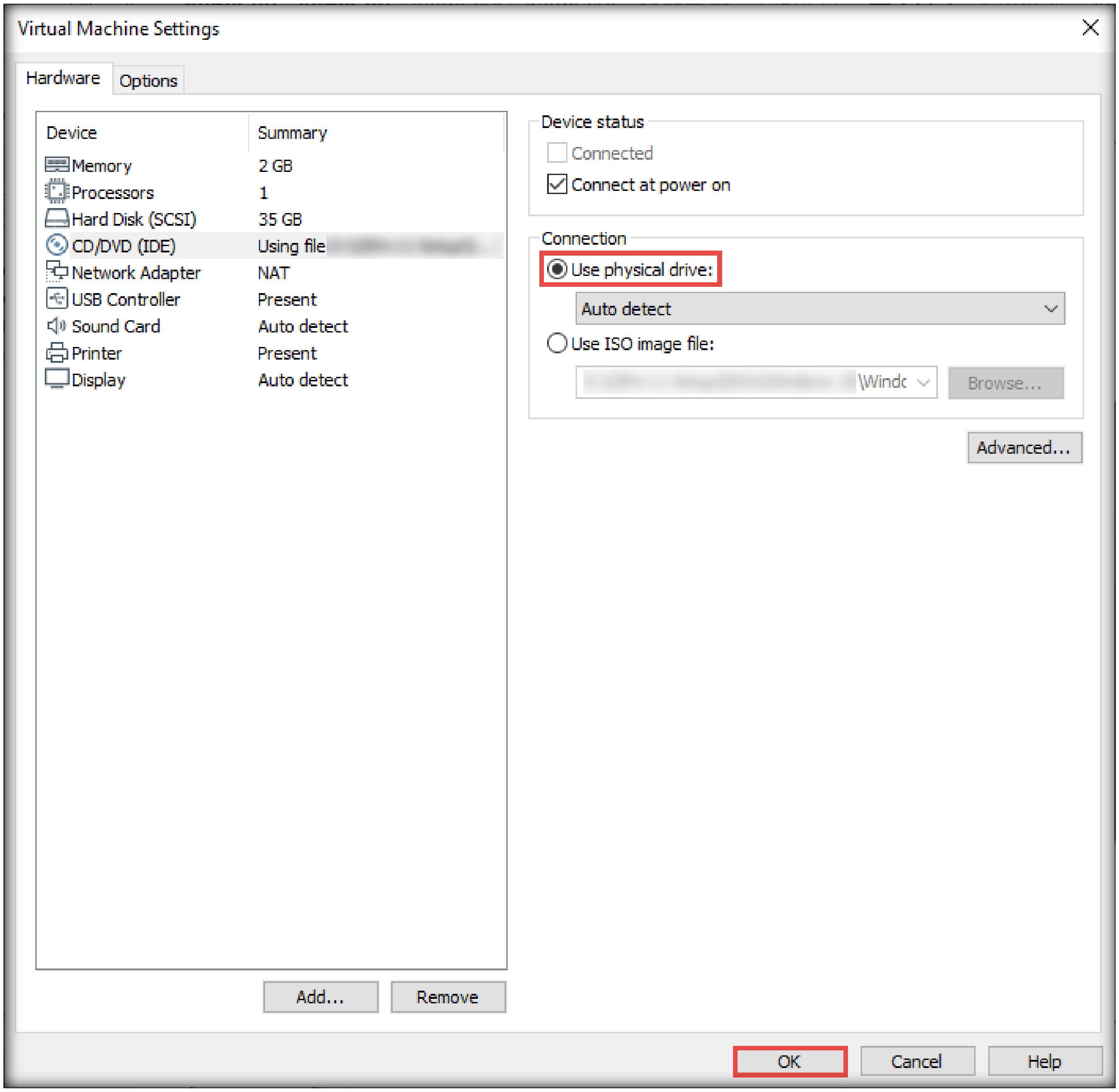
**Note**: If the above-mentioned tools are not installed, then install them by issuing the command: **apt-get install <Tool name>**

61. Shut down the **Parrot Security** virtual machine.
62. Once the machine has turned off, in the **Devices** section of the **Parrot Security** tab, click **CD\DVD (IDE)** under the devices section.


Parrot Security - VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Shared VMs
Home
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Parrot Security
Power on this virtual machine
Edit virtual machine settings
Devices
Description
Type here to enter a description of this virtual machine.
Virtual Machine Details

| | |
|---|---|
| Memory | 2 GB |
| Processors | 1 |
| Hard Disk (SCSI) | 35 GB |
| CD/DVD (IDE) | Using file [redacted] |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

63. The **Virtual Machine Settings** window appears; choose the **Use physical drive:** radio button under the **Connection** section and click **OK**.



Virtual Machine Settings
Hardware
Options
Add...
Remove
OK
Cancel
Help
Advanced...
Browse...

| Device | Summary |
|---|---|
| Memory | 2 GB |
| Processors | 1 |
| Hard Disk (SCSI) | 35 GB |
| CD/DVD (IDE) | Using file |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

Device status
☐ Connected
☑ Connect at power on

Connection
● Use physical drive:
Auto detect
○ Use ISO image file:
\Windc

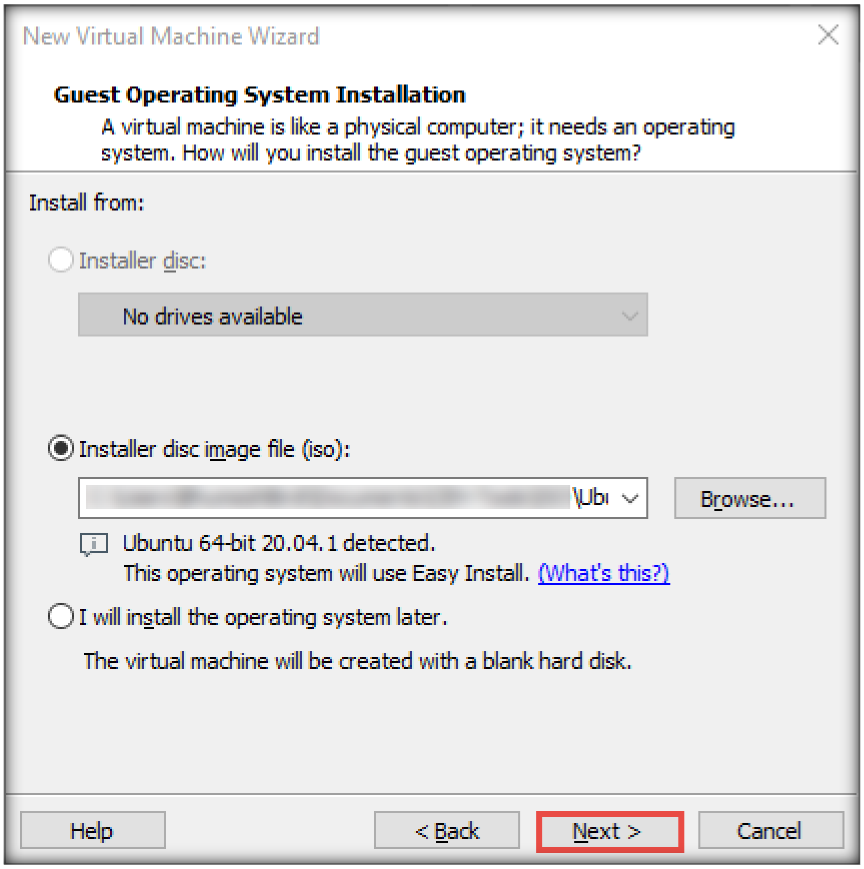
[Back to Configuration Task Outline]

# CT#11: Install the Ubuntu Virtual Machine in VMware

1. The next step is to set up the **Ubuntu** virtual machine in VMWare Workstation Pro
2. In the **VMware Workstation** window, click **Create a New Virtual Machine**.
3. In the **New Virtual Machine Wizard** window that appears, leave the settings set to default (**Typical**) and click **Next**.
4. In the **Guest Operating System Installation** wizard, choose the **Installer disc image file (iso)**: radio button. Click **Browse** to provide the ISO path of Ubuntu ISO file. Then, select the Ubuntu ISO file and click **Open** to provide the ISO path. Finally, click **Next**

   **Note**: Here, we have used the **Ubuntu** .iso file (**ubuntu-20.04.1-desktop-amd64.iso**) for creating the **Ubuntu** virtual machine. However, you can download the latest ISO file from **https://ubuntu.com/download/desktop**.

   **Note**: If you decide to download the latest version, the screenshots presented here might differ from what you see in your lab environment.



New Virtual Machine Wizard

**Guest Operating System Installation**

A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?

Install from:

○ Installer disc:

No drives available

● Installer disc image file (iso):

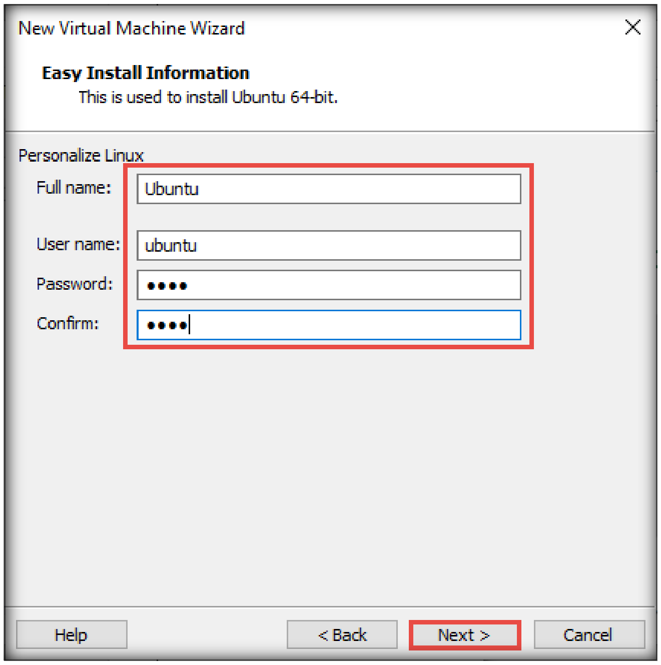
[redacted]\Ubı

Ubuntu 64-bit 20.04.1 detected.
This operating system will use Easy Install. (What's this?)

○ I will install the operating system later.

The virtual machine will be created with a blank hard disk.

5. The **Easy Install Information** wizard appears; type the following information in the **Personalize Linux** section and click **Next**.
    - Full name: **Ubuntu**
    - User name: **ubuntu**
    - Password: **toor**
    - Confirm: **toor**



New Virtual Machine Wizard

**Easy Install Information**

This is used to install Ubuntu 64-bit.

Personalize Linux

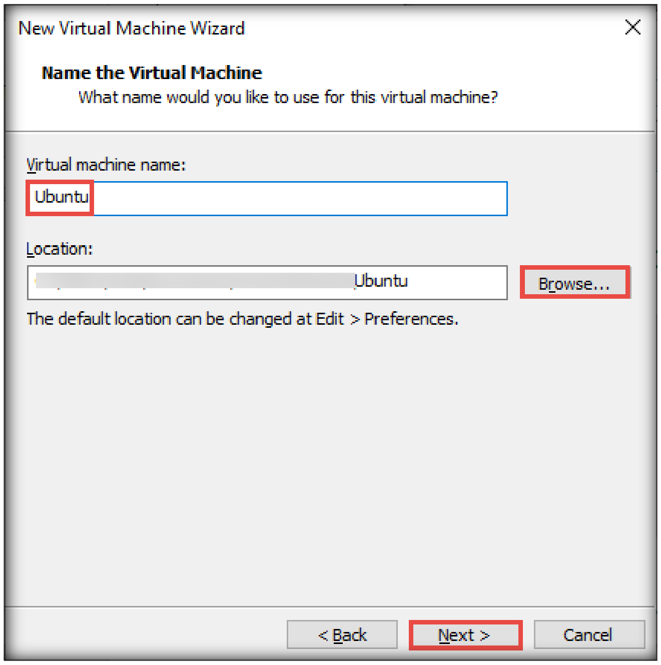
Full name: Ubuntu

User name: ubuntu

Password: ••••

Confirm: ••••

6. The **Name the Virtual Machine** wizard appears; type **Ubuntu** in the **Virtual machine name** field, and click the **Browse** button to store the virtual hard disk; click **Next**.



New Virtual Machine Wizard

**Name the Virtual Machine**

What name would you like to use for this virtual machine?

Virtual machine name:

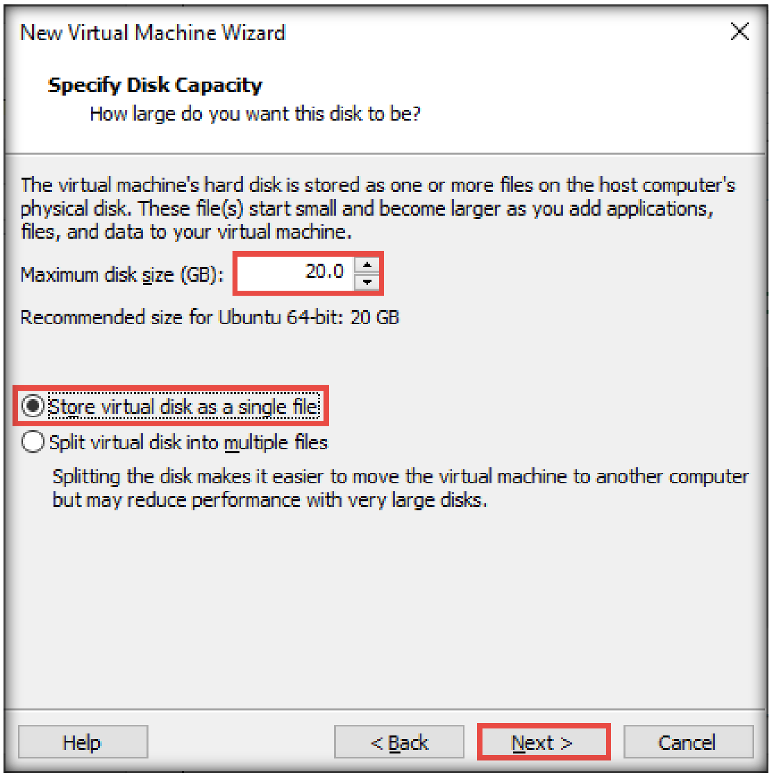
Ubuntu

Location:

[redacted]Ubuntu

The default location can be changed at Edit > Preferences.

7. The **Specify Disk Capacity** wizard appears. Leave **Maximum disk size (GB)** as recommended (here, **20 GB**) and select **Store virtual disk as a single file**; click **Next**.



New Virtual Machine Wizard

**Specify Disk Capacity**

How large do you want this disk to be?

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (GB): 20.0

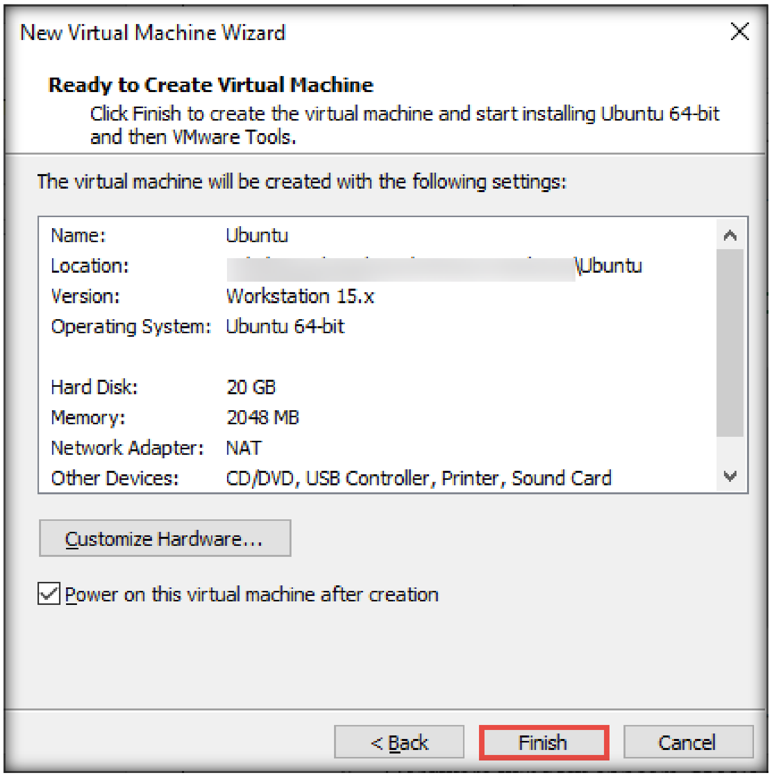
Recommended size for Ubuntu 64-bit: 20 GB

● Store virtual disk as a single file

○ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

8. Click **Finish** in the **Ready to Create Virtual Machine** wizard.



New Virtual Machine Wizard

**Ready to Create Virtual Machine**

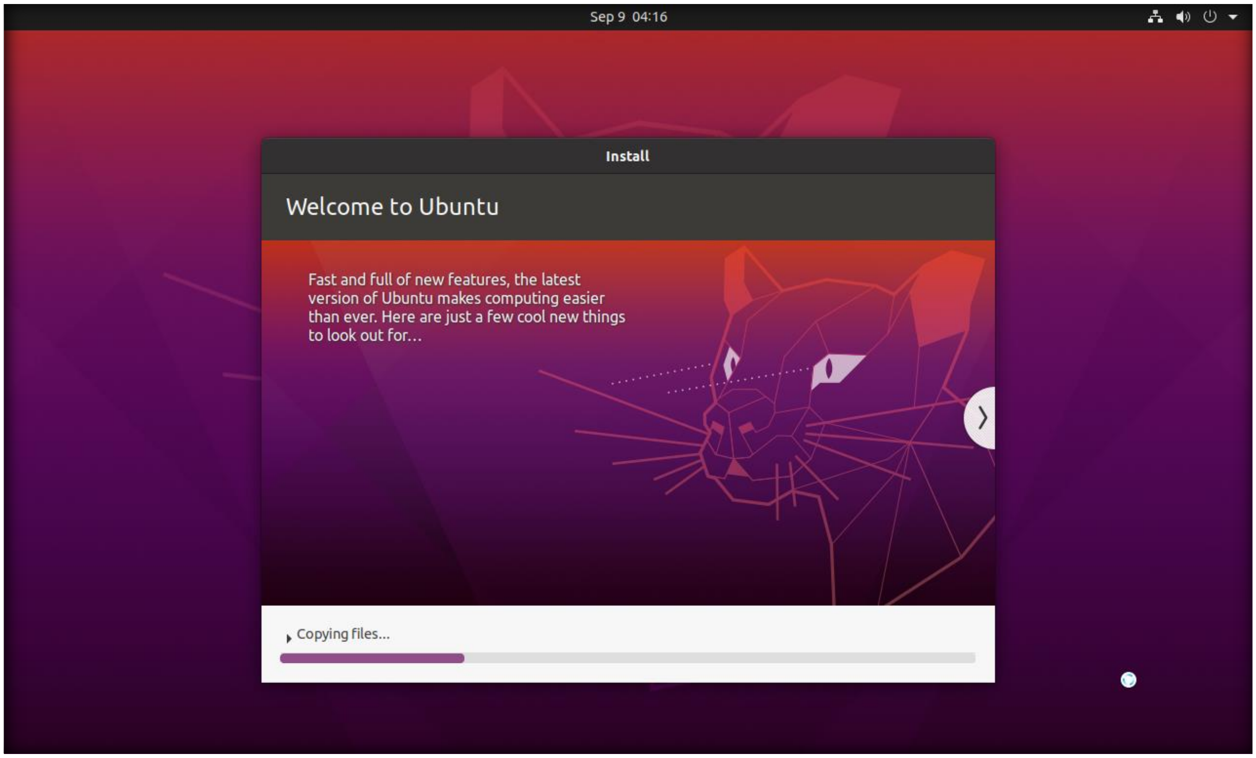
Click Finish to create the virtual machine and start installing Ubuntu 64-bit and then VMware Tools.

The virtual machine will be created with the following settings:

|  |  |
|---|---|
| Name: | Ubuntu |
| Location: | [redacted]\Ubuntu |
| Version: | Workstation 15.x |
| Operating System: | Ubuntu 64-bit |
|  |  |
| Hard Disk: | 20 GB |
| Memory: | 2048 MB |
| Network Adapter: | NAT |
| Other Devices: | CD/DVD, USB Controller, Printer, Sound Card |

☑ Power on this virtual machine after creation

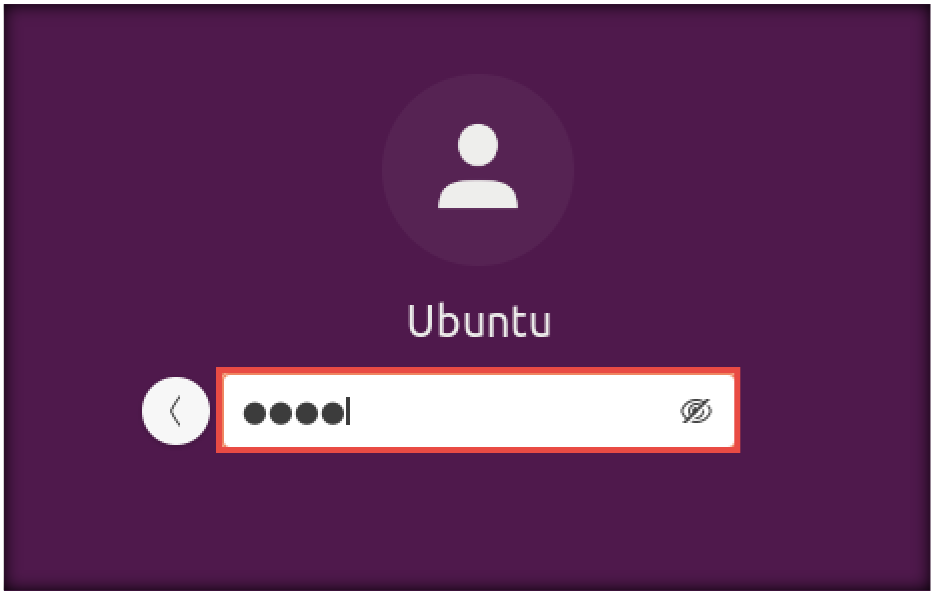
9. As soon as you click the **Finish** button, **VMware Workstation** starts installing the Ubuntu OS, as shown in the screenshot. Wait until installation has completed.



Fast and full of new features, the latest version of Ubuntu makes computing easier than ever. Here are just a few cool new things to look out for...

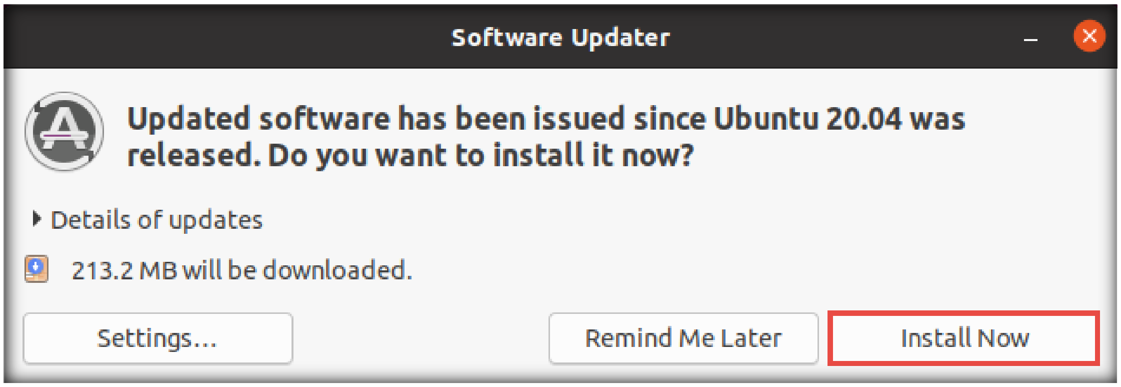
Copying files...

10. Once the installation has finished, the machine will restart and provide you with a login screen with the username **Ubuntu**. Click **Ubuntu**, type **toor** in the **Password** field, and press **Enter** to sign in.



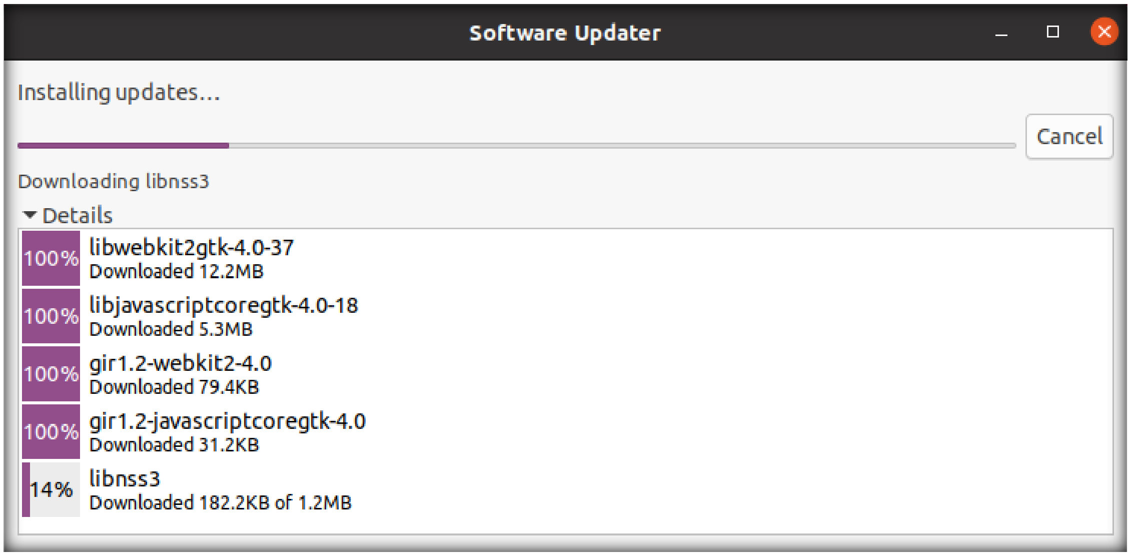
11. The **Online Accounts** pop-up window appears; click **Skip**. Follow the steps and click **Next** in each step. In the last step, click **Done**.

12. If a **Software Updater** pop-up window appears, click **Install Now** to install the latest updates. This process may take some time.


Software Updater
Details of updates
Settings…
Remind Me Later
Install Now

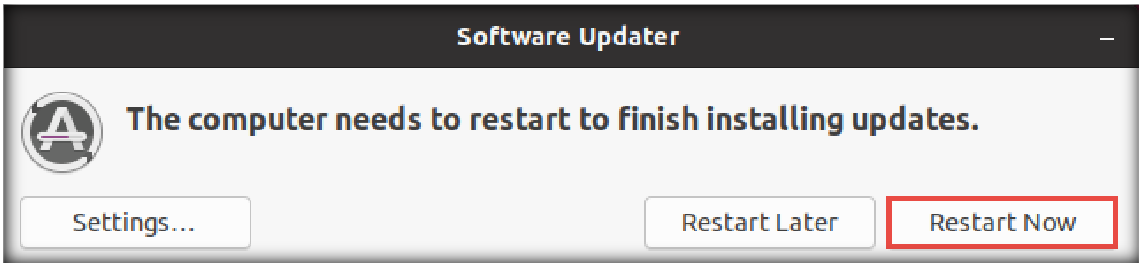
Updated software has been issued since Ubuntu 20.04 was released. Do you want to install it now?

213.2 MB will be downloaded.


Software Updater
Cancel
Details

```
Installing updates…

Downloading libnss3

100% libwebkit2gtk-4.0-37
     Downloaded 12.2MB
100% libjavascriptcoregtk-4.0-18
     Downloaded 5.3MB
100% gir1.2-webkit2-4.0
     Downloaded 79.4KB
100% gir1.2-javascriptcoregtk-4.0
     Downloaded 31.2KB
14%  libnss3
     Downloaded 182.2KB of 1.2MB
```

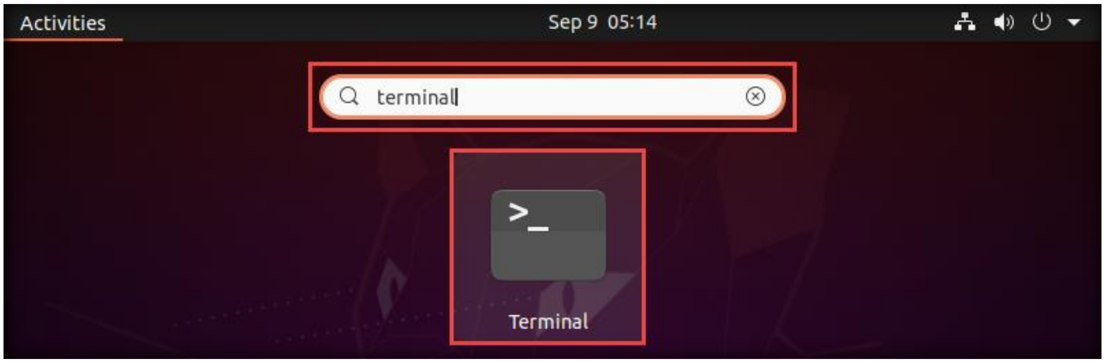
13. After the updates have installed, click the **Restart Now** button to restart the machine.


Software Updater
Settings…
Restart Later
Restart Now

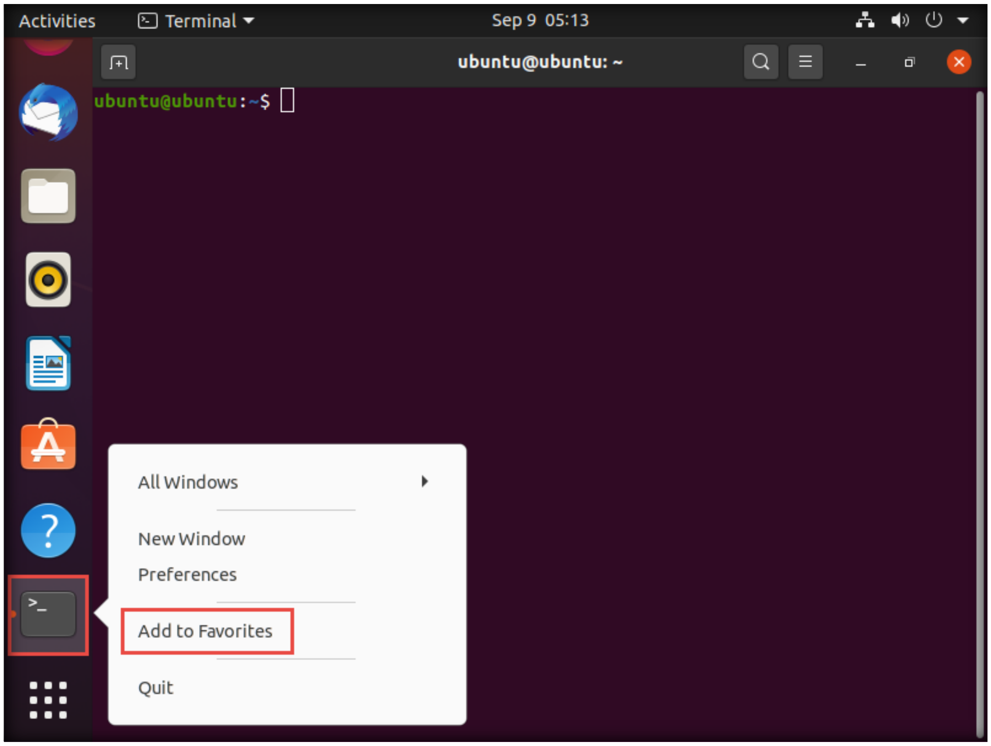
The computer needs to restart to finish installing updates.

14. Log in again with the Username: **Ubuntu** and Password: **toor**

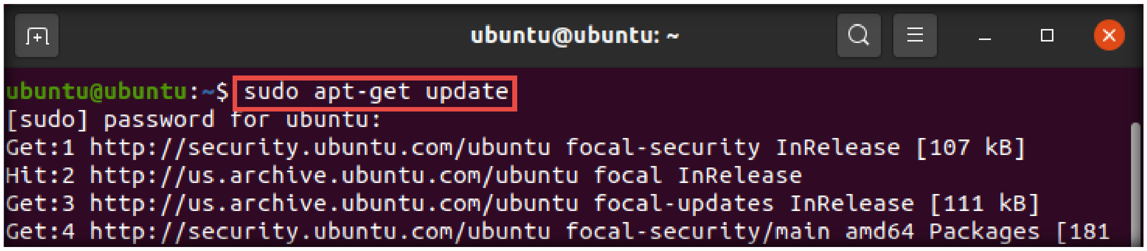
15. Click the **Show Applications** (⋮⋮⋮) icon in the bottom-left corner of **Desktop**. Then, type **terminal** in the search bar and, from the search results, click the **Terminal** icon to launch the terminal window.


Activities
Sep 9 05:14
terminal
Terminal

16. The **Terminal** window appears. Right-click on the **Terminal** icon on the **Favorites** bar on the left-hand side of the window and click **Add to Favorites**, as shown in the screenshot, to lock the terminal on the launcher.


Activities
Terminal
Sep 9 05:13
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$
All Windows
New Window
Preferences
Add to Favorites
Quit

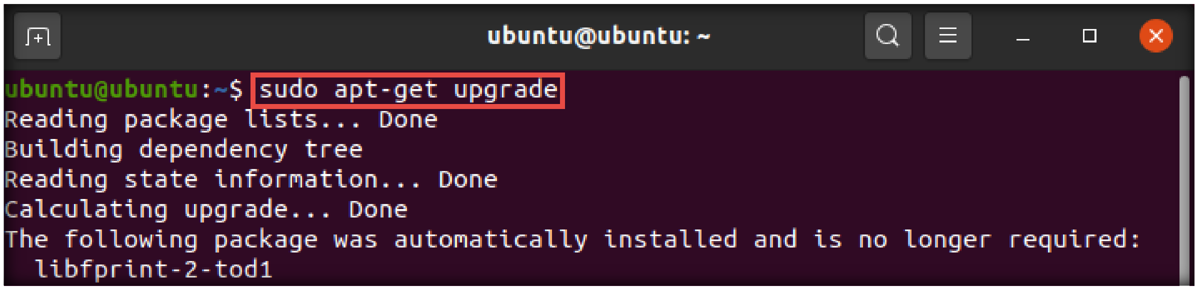
17. In the terminal window, type **sudo apt-get update** and press **Enter**. In the **password for ubuntu** field, type **toor** and press **Enter**. The password that you type will not be visible.


ubuntu@ubuntu: ~

```
ubuntu@ubuntu:~$ sudo apt-get update
[sudo] password for ubuntu:
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [107 kB]
Hit:2 http://us.archive.ubuntu.com/ubuntu focal InRelease
Get:3 http://us.archive.ubuntu.com/ubuntu focal-updates InRelease [111 kB]
Get:4 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [181
```

18. In the terminal window, type **sudo apt-get upgrade** and press **Enter**.

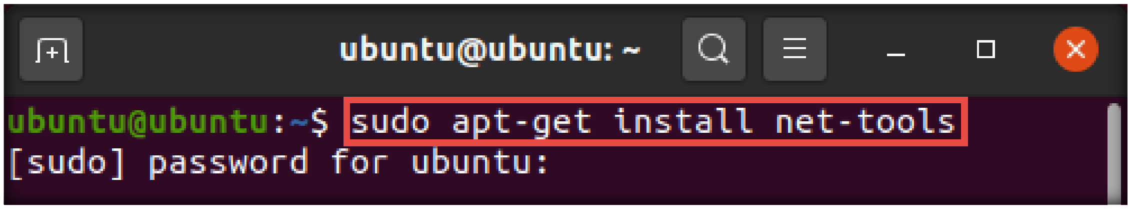
    **Note**: If a prompt appears asking **Do you want to continue?**, type **Y** and press **Enter**.



```
ubuntu@ubuntu:~$ sudo apt-get upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
```

19. Restart the machine and log in again with the Username: **Ubuntu** and Password: **toor**.

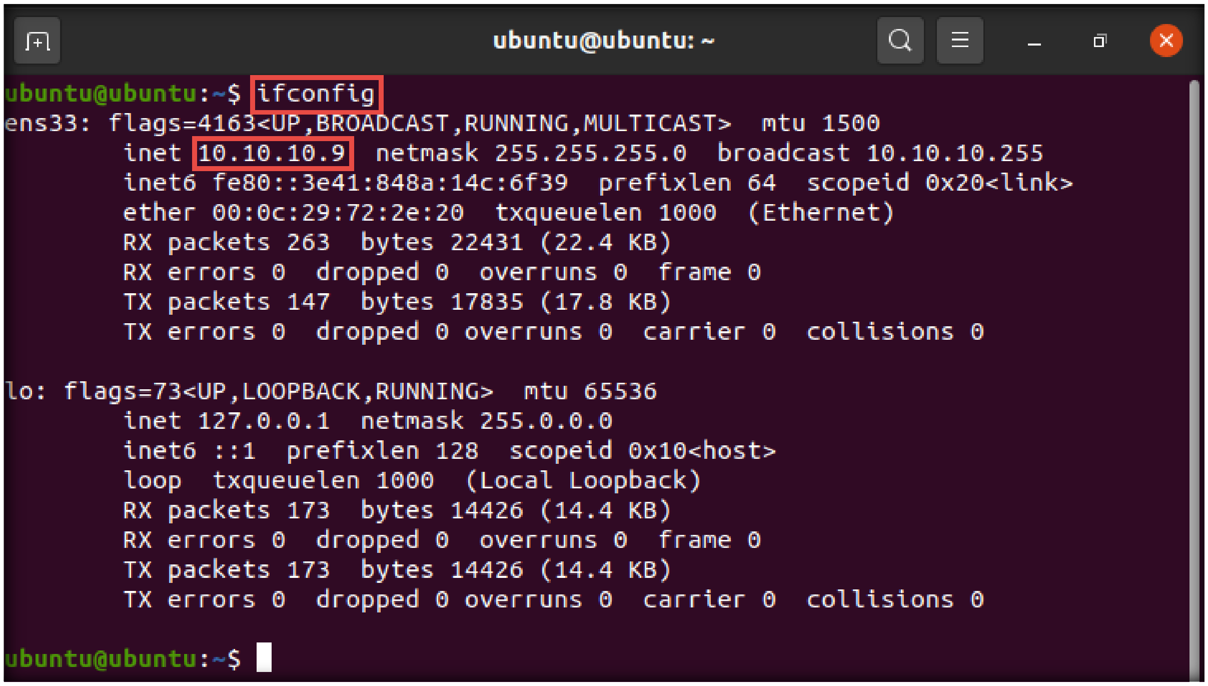
20. In the terminal window, type **sudo apt-get install net-tools** and press **Enter**. In the **password for ubuntu** field, type **toor** and press **Enter**. The password that you type will not be visible.



```
ubuntu@ubuntu:~$ sudo apt-get install net-tools
[sudo] password for ubuntu:
```

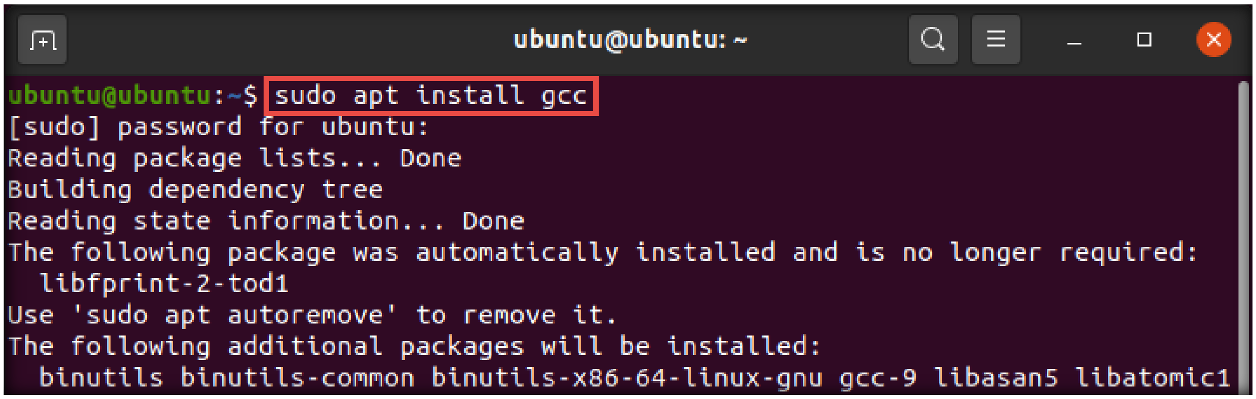
21. After the installation, type **ifconfig** and press **Enter** to check with the enabled network adapter. Here, the network adapter is **ens33**, as shown in the screenshot.

    **Note**: The network adapter may vary in your lab environment.



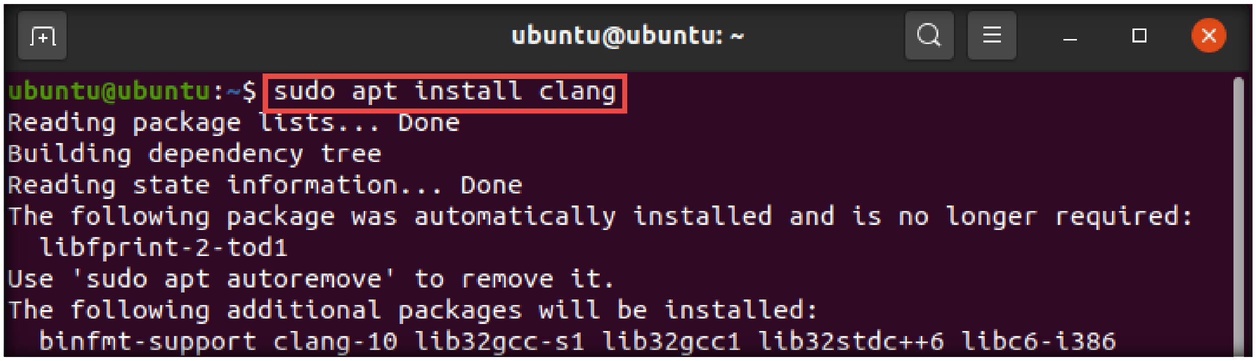
```
ubuntu@ubuntu:~$ ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.10.10.9  netmask 255.255.255.0  broadcast 10.10.10.255
        inet6 fe80::3e41:848a:14c:6f39  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:72:2e:20  txqueuelen 1000  (Ethernet)
        RX packets 263  bytes 22431 (22.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 147  bytes 17835 (17.8 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 173  bytes 14426 (14.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 173  bytes 14426 (14.4 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

ubuntu@ubuntu:~$ 
```

22. In the terminal window, type **sudo apt install gcc** and press **Enter**. In the **password for ubuntu** field, type **toor** and press **Enter**. The password that you type will not be visible.



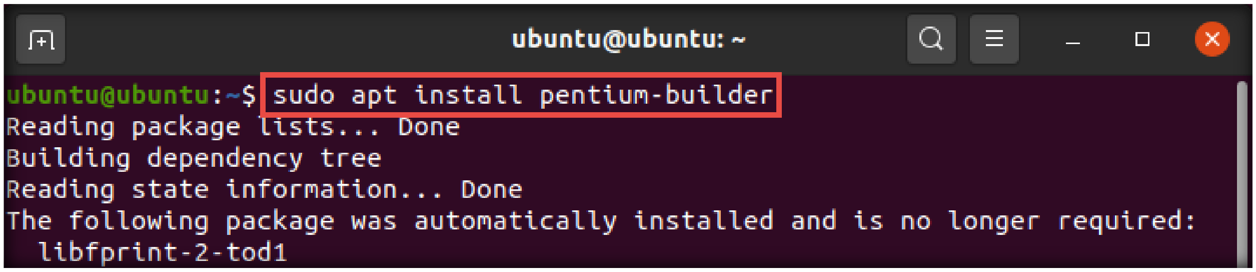
```
ubuntu@ubuntu:~$ sudo apt install gcc
[sudo] password for ubuntu:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu gcc-9 libasan5 libatomic1
```

23. Type **sudo apt install clang** and press **Enter**. In the **password for ubuntu** field, type **toor** and press **Enter**. The password that you type will not be visible.



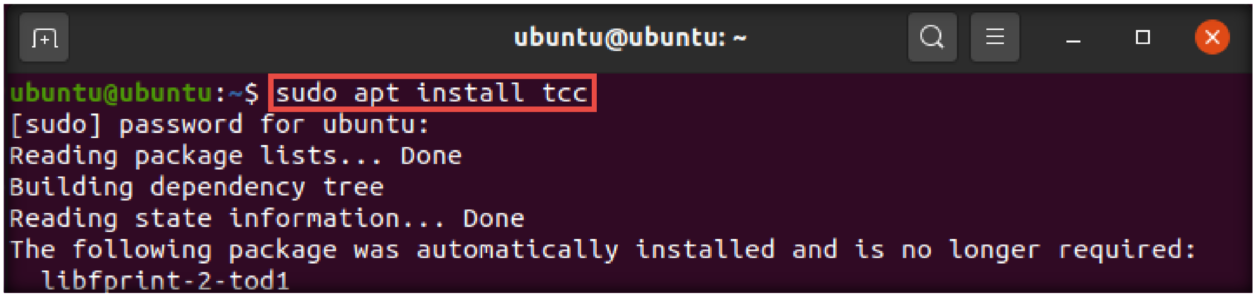
```
ubuntu@ubuntu:~$ sudo apt install clang
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  binfmt-support clang-10 lib32gcc-s1 lib32gcc1 lib32stdc++6 libc6-i386
```

24. Type **sudo apt install pentium-builder** and press **Enter**. In the **password for ubuntu** field, type **toor** and press **Enter**. The password that you type will not be visible.



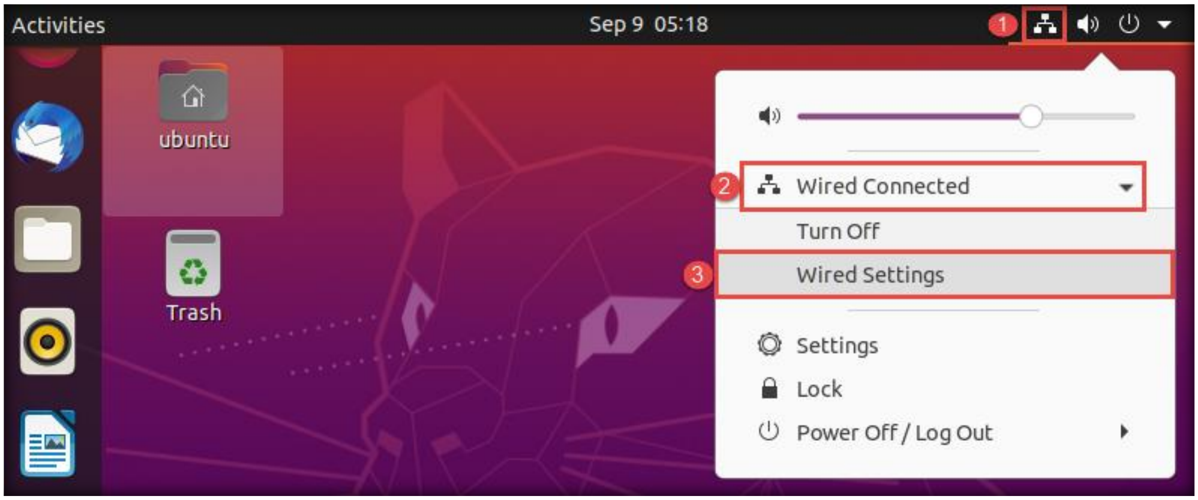
```
ubuntu@ubuntu:~$ sudo apt install pentium-builder
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
```

25. Type **sudo apt install tcc** and press **Enter**. In the **password for ubuntu** field, type **toor** and press **Enter**. The password that you type will not be visible.

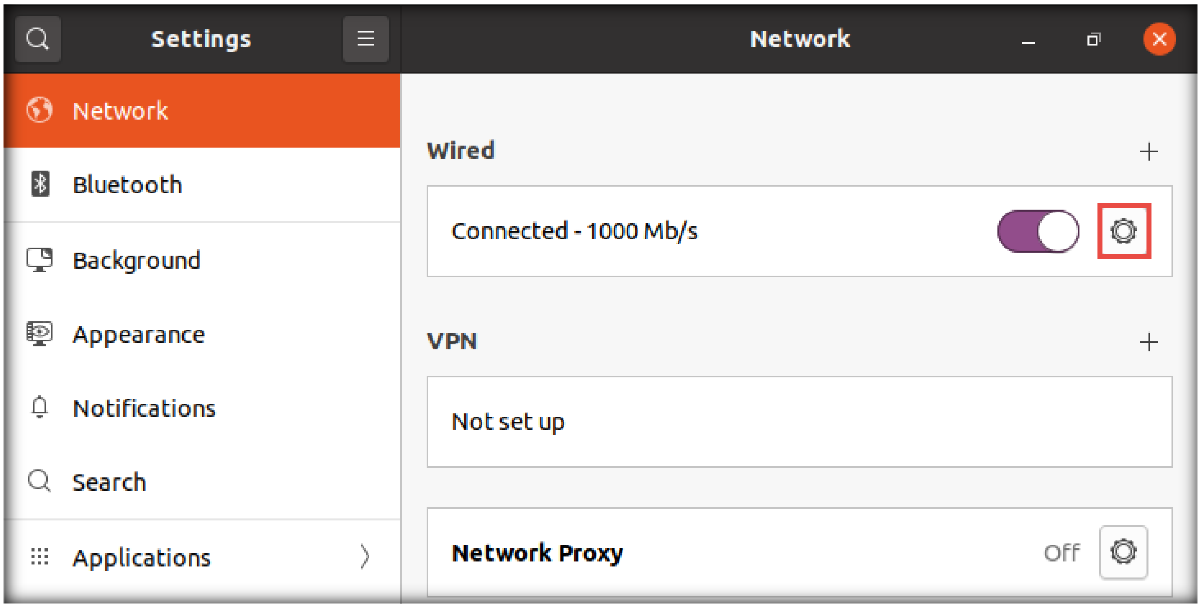


```
ubuntu@ubuntu:~$ sudo apt install tcc
[sudo] password for ubuntu:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
```

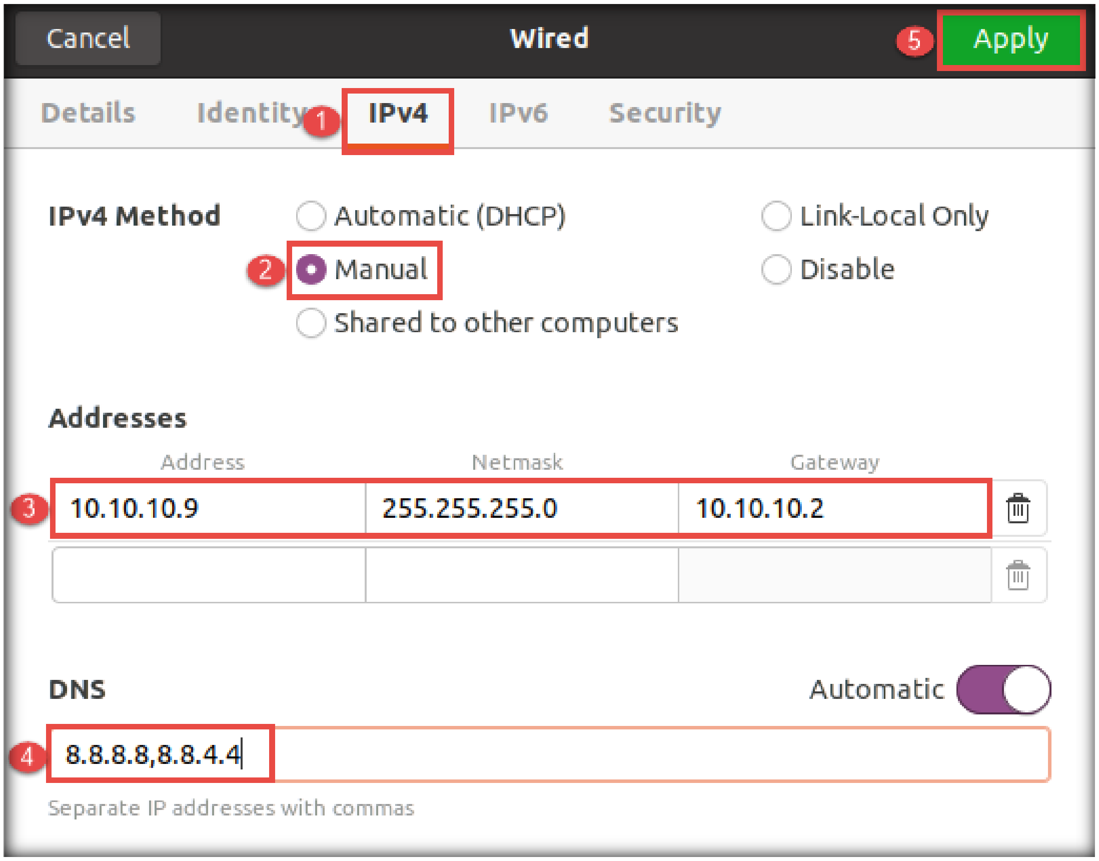
26. Close the terminal window. Now, we need to configure IP address to a Static IP address.
27. Click the **Network** icon in the top-right corner of the **Desktop**. Then, click **Wired Connected** → **Wired Settings**, as the screenshot demonstrates.


Activities
Sep 9 05:18
1
2
3
ubuntu
Trash
Wired Connected
Turn Off
Wired Settings
Settings
Lock
Power Off / Log Out

28. Click the **Settings** icon in the **Wired** section.


Settings
Network
Network
Bluetooth
Background
Appearance
Notifications
Search
Applications
Wired
Connected - 1000 Mb/s
VPN
Not set up
Network Proxy
Off

29. Now, navigate to the **IPv4** tab and select the **Manual** radio button under the **IPv4 Method** section. Under the **Addresses** section, type **10.10.10.9**, **255.255.255.0**, and **10.10.10.2** in the **Address**, **Netmask**, **Gateway** boxes, respectively. Then add **8.8.8.8,8.8.4.4** to the **DNS** box and click **Apply**. The screenshot shows this process.


Cancel
Wired
5
Apply
Details
Identity
1
IPv4
IPv6
Security
IPv4 Method
○ Automatic (DHCP)
○ Link-Local Only
2
● Manual
○ Disable
○ Shared to other computers
Addresses
Address
Netmask
Gateway
3
4
DNS
Automatic

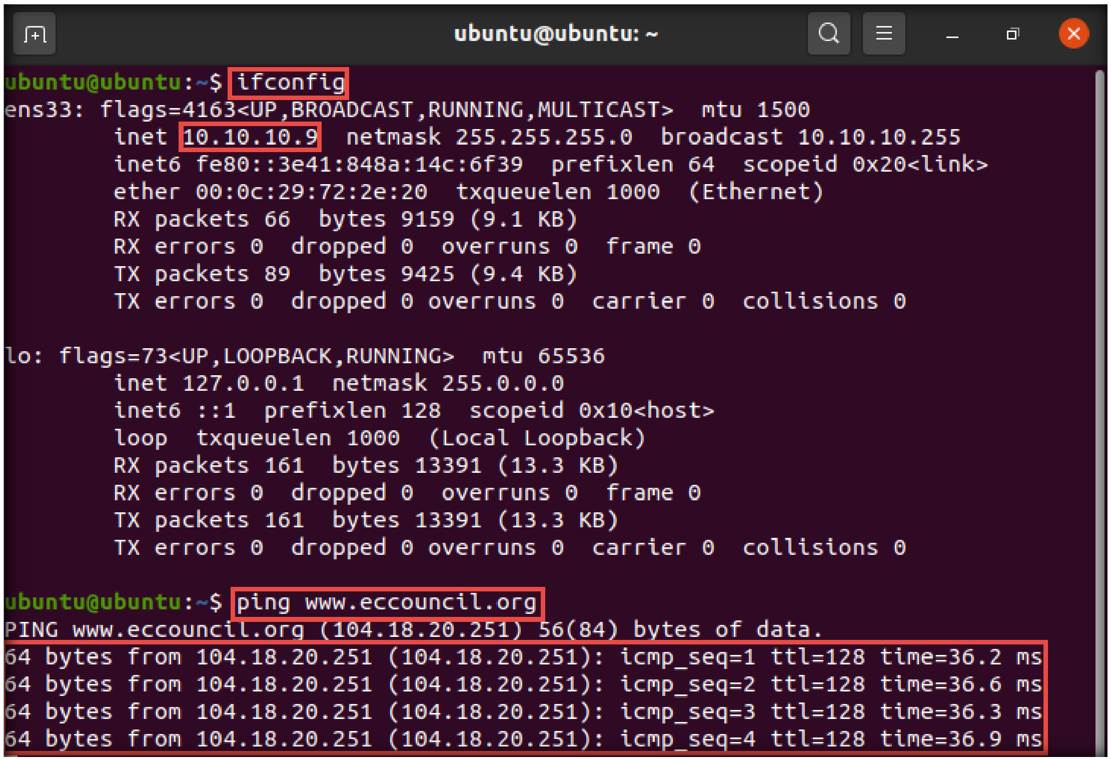
| Address | Netmask | Gateway |
|---|---|---|
| 10.10.10.9 | 255.255.255.0 | 10.10.10.2 |

DNS: 8.8.8.8,8.8.4.4

Separate IP addresses with commas

30. Close all windows and reboot the virtual machine. After the machine restarts, log in to user **Ubuntu** with password **toor**.

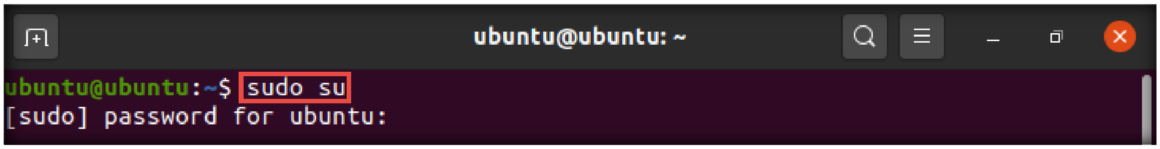
31. Open **Terminal,** type **ifconfig**, and press **Enter** to verify the configured IP address. Then, type **ping www.eccouncil.org** to verify the Internet connectivity. Press **CTRL+C** to stop the ping command.



```
ubuntu@ubuntu:~$ ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.10.10.9  netmask 255.255.255.0  broadcast 10.10.10.255
        inet6 fe80::3e41:848a:14c:6f39  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:72:2e:20  txqueuelen 1000  (Ethernet)
        RX packets 66  bytes 9159 (9.1 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 89  bytes 9425 (9.4 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 161  bytes 13391 (13.3 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 161  bytes 13391 (13.3 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

ubuntu@ubuntu:~$ ping www.eccouncil.org
PING www.eccouncil.org (104.18.20.251) 56(84) bytes of data.
64 bytes from 104.18.20.251 (104.18.20.251): icmp_seq=1 ttl=128 time=36.2 ms
64 bytes from 104.18.20.251 (104.18.20.251): icmp_seq=2 ttl=128 time=36.6 ms
64 bytes from 104.18.20.251 (104.18.20.251): icmp_seq=3 ttl=128 time=36.3 ms
64 bytes from 104.18.20.251 (104.18.20.251): icmp_seq=4 ttl=128 time=36.9 ms
```

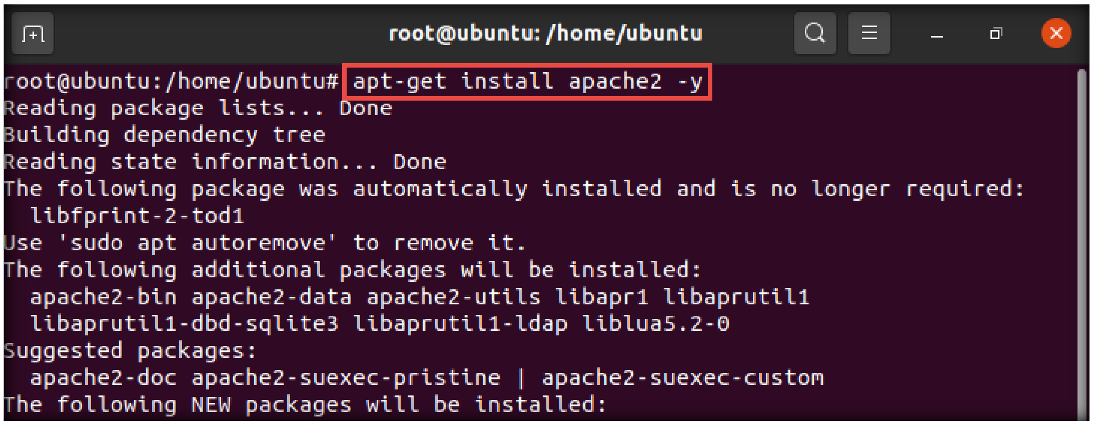
32. Now, we shall install **apache2 server** and **vim editor** on the Ubuntu virtual machine. To do this, in the terminal window, type **sudo su** and press **Enter**.

33. You will be prompted to enter a password. Type the password as **toor** and press **Enter**. The password that you type will not be visible.



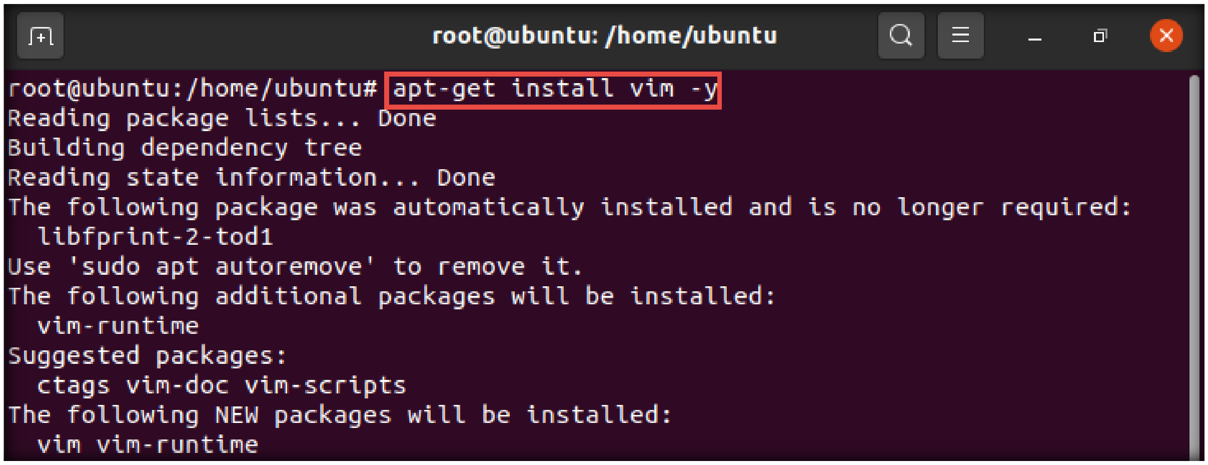
```
ubuntu@ubuntu:~$ sudo su
[sudo] password for ubuntu:
```

34. Type the command **apt-get install apache2 -y** and press **Enter**. This command installs the apache web server.



```
root@ubuntu:/home/ubuntu# apt-get install apache2 -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom
The following NEW packages will be installed:
```

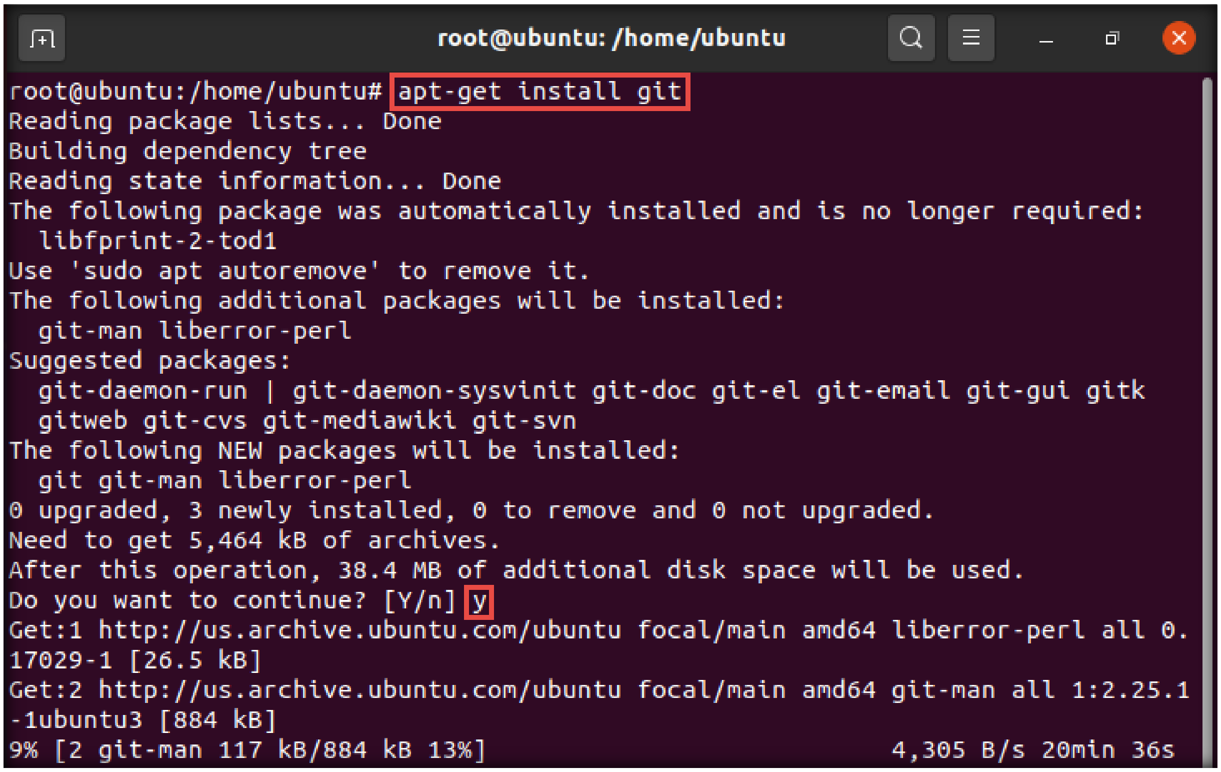
35. Type the command **apt-get install vim -y** and press **Enter**. This command installs vim editor



```
root@ubuntu:/home/ubuntu# apt-get install vim -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  vim-runtime
Suggested packages:
  ctags vim-doc vim-scripts
The following NEW packages will be installed:
  vim vim-runtime
```

36. Type the command **apt-get install git** and press **Enter**. This command installs git clone.

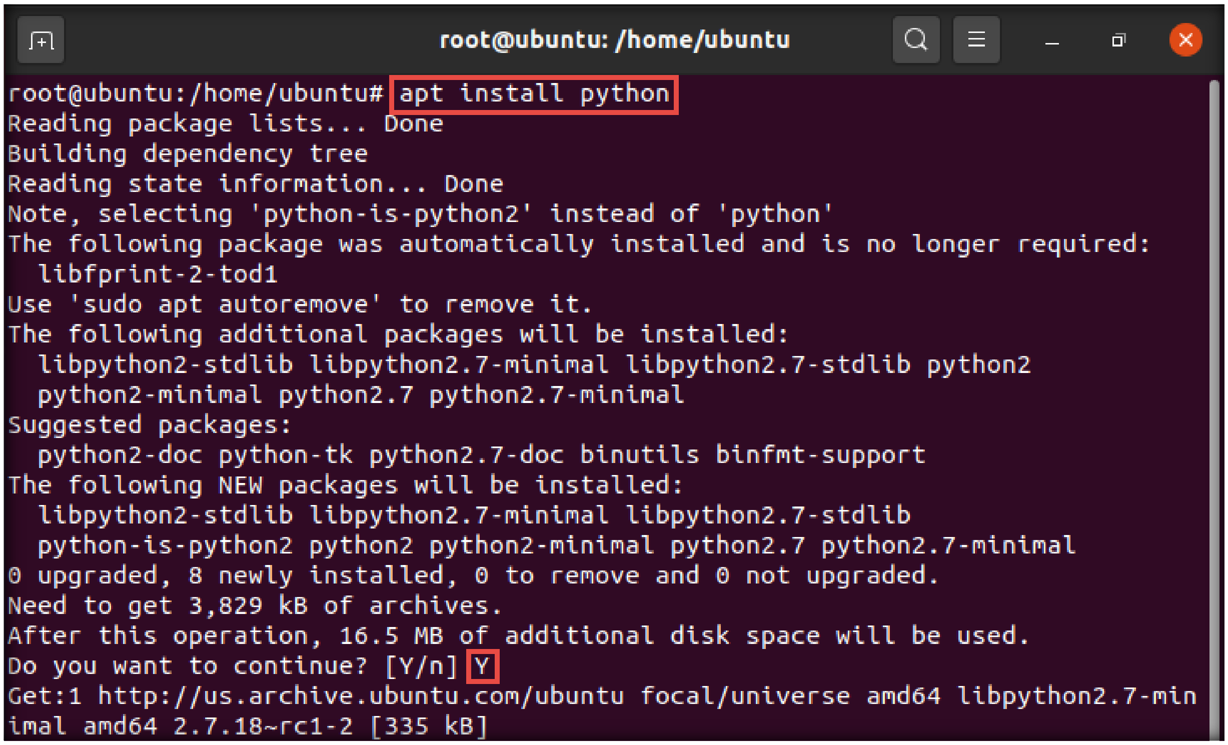
**Note**: If a prompt appears asking **Do you want to continue?**, type **Y** and press **Enter**.



```
root@ubuntu:/home/ubuntu# apt-get install git
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  git-man liberror-perl
Suggested packages:
  git-daemon-run | git-daemon-sysvinit git-doc git-el git-email git-gui gitk
  gitweb git-cvs git-mediawiki git-svn
The following NEW packages will be installed:
  git git-man liberror-perl
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 5,464 kB of archives.
After this operation, 38.4 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu focal/main amd64 liberror-perl all 0.
17029-1 [26.5 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu focal/main amd64 git-man all 1:2.25.1
-1ubuntu3 [884 kB]
9% [2 git-man 117 kB/884 kB 13%]                          4,305 B/s 20min 36s
```

37. Type the command **apt install python** and press **Enter**. This command installs python clone.

    **Note**: If a prompt appears, asking **Do you want to continue?**, type **Y** and press **Enter**.



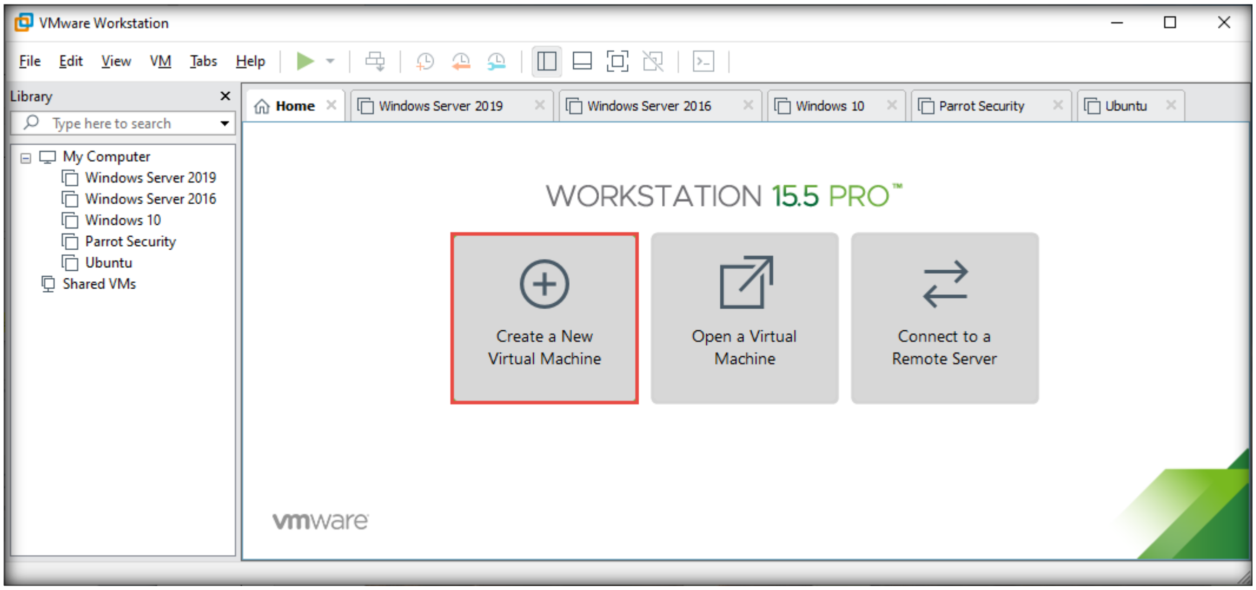
```
root@ubuntu:/home/ubuntu# apt install python
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'python-is-python2' instead of 'python'
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  libpython2-stdlib libpython2.7-minimal libpython2.7-stdlib python2
  python2-minimal python2.7 python2.7-minimal
Suggested packages:
  python2-doc python-tk python2.7-doc binutils binfmt-support
The following NEW packages will be installed:
  libpython2-stdlib libpython2.7-minimal libpython2.7-stdlib
  python-is-python2 python2 python2-minimal python2.7 python2.7-minimal
0 upgraded, 8 newly installed, 0 to remove and 0 not upgraded.
Need to get 3,829 kB of archives.
After this operation, 16.5 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libpython2.7-min
imal amd64 2.7.18~rc1-2 [335 kB]
```

38. After installing, close the terminal window and shut down the virtual machine.

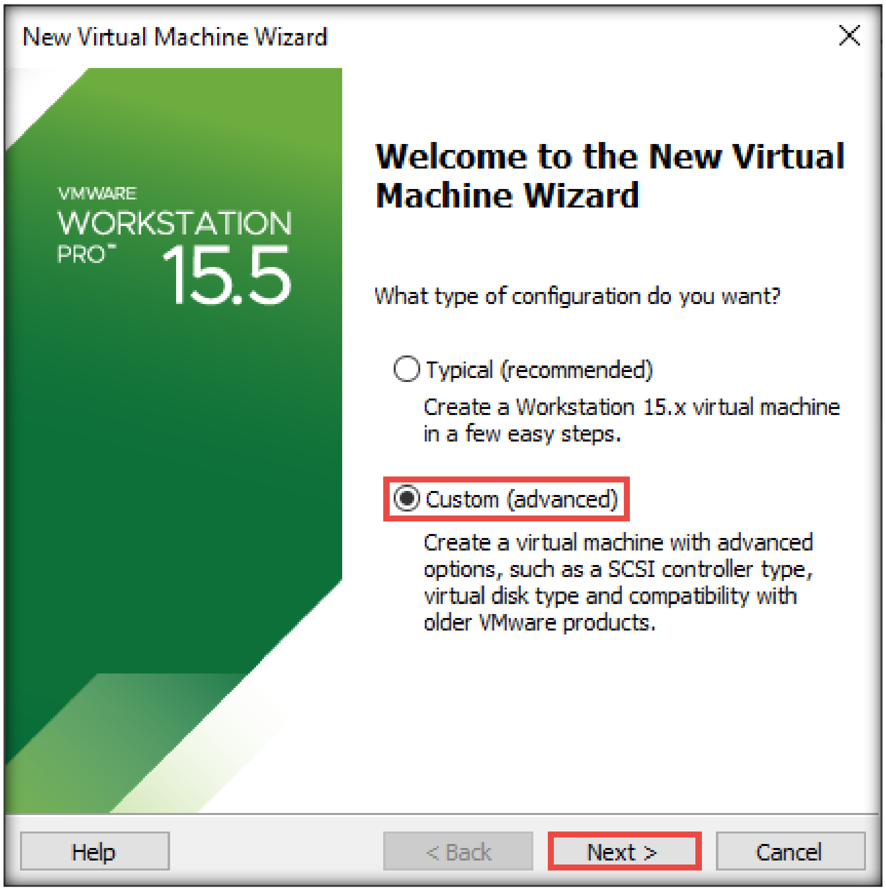
[Back to Configuration Task Outline]

# CT#12: Install Android Virtual Machine in VMware

1. In the **VMware Workstation** window, click **Create a New Virtual Machine**.


VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Ubuntu
Shared VMs
Home
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Ubuntu
WORKSTATION 15.5 PRO™
Create a New Virtual Machine
Open a Virtual Machine
Connect to a Remote Server
vmware

2. In the **New Virtual Machine Wizard** window, choose the **Custom (advanced)** radio button and click **Next**.


New Virtual Machine Wizard
VMWARE WORKSTATION PRO™ 15.5

Welcome to the New Virtual Machine Wizard

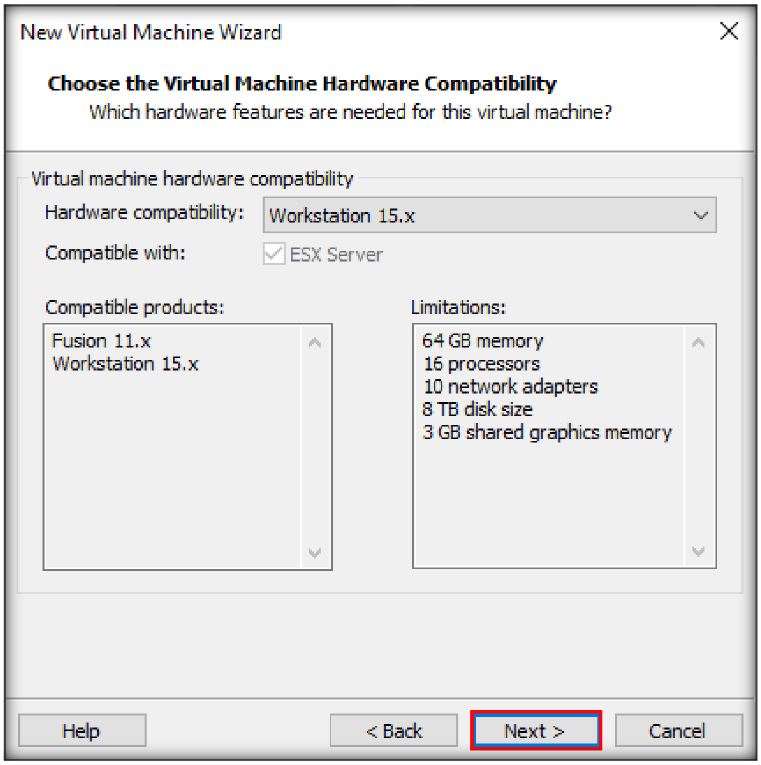
What type of configuration do you want?

○ Typical (recommended)
Create a Workstation 15.x virtual machine in a few easy steps.

● Custom (advanced)
Create a virtual machine with advanced options, such as a SCSI controller type, virtual disk type and compatibility with older VMware products.

Help
< Back
Next >
Cancel

3. The **Choose the Virtual Machine Hardware Compatibility** wizard appears; leave the default settings and click **Next**.



**Choose the Virtual Machine Hardware Compatibility**

Which hardware features are needed for this virtual machine?

Virtual machine hardware compatibility

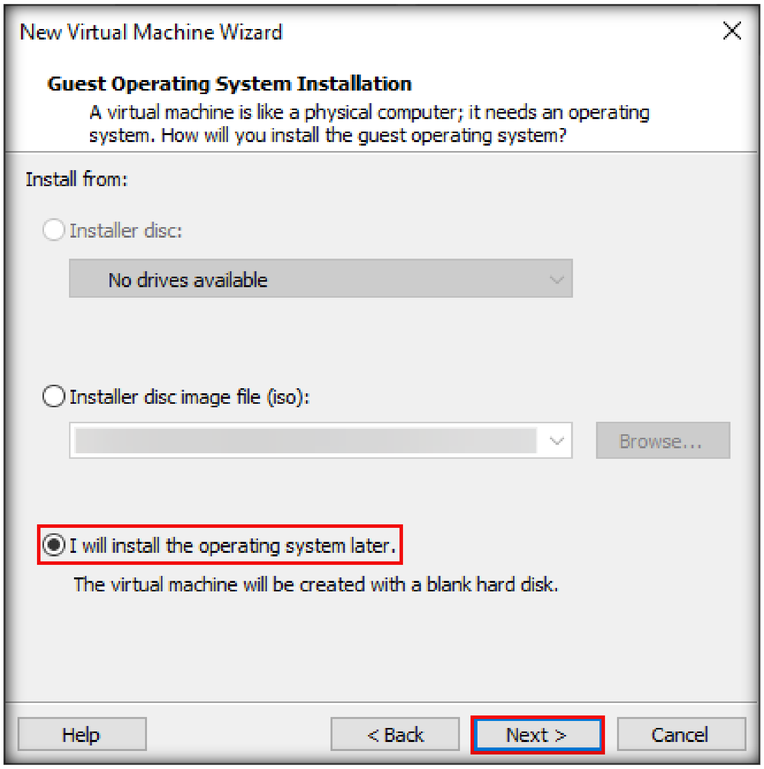
Hardware compatibility: Workstation 15.x

Compatible with: ☑ ESX Server

Compatible products:
Fusion 11.x
Workstation 15.x

Limitations:
64 GB memory
16 processors
10 network adapters
8 TB disk size
3 GB shared graphics memory

4. In the **Guest Operating System Installation** wizard, choose the **I will install the operating system later** radio button and click **Next**.



**Guest Operating System Installation**

A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?

Install from:

○ Installer disc:

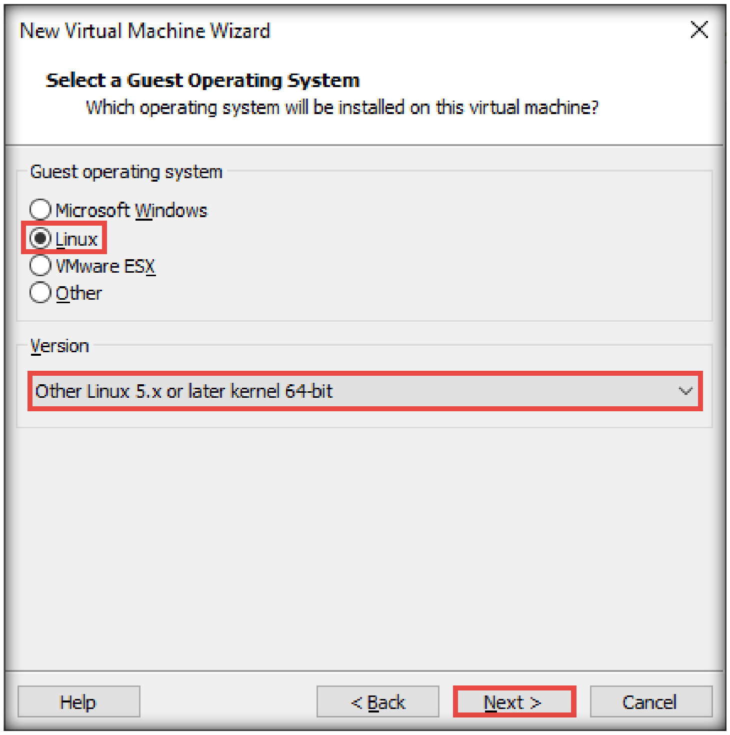
No drives available

○ Installer disc image file (iso):

● I will install the operating system later.

The virtual machine will be created with a blank hard disk.

5. In the **Select a Guest Operating System** wizard, select the **Linux** radio button and select **Other Linux 5.x or later kernel 64-bit** from the **Version** drop-down section; click **Next**.



New Virtual Machine Wizard

**Select a Guest Operating System**

Which operating system will be installed on this virtual machine?

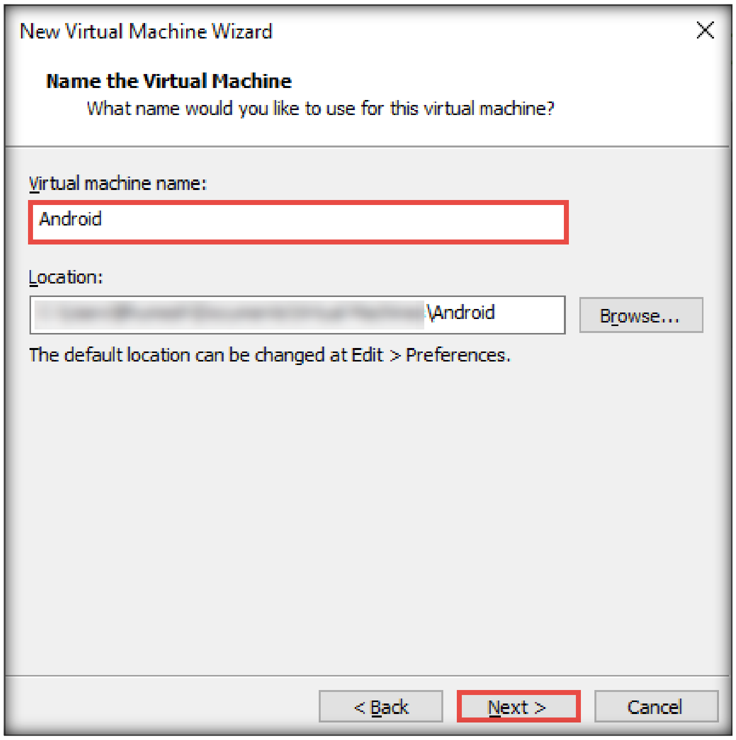
Guest operating system

○ Microsoft Windows
● Linux
○ VMware ESX
○ Other

Version

Other Linux 5.x or later kernel 64-bit

6. The **Name the Virtual Machine** wizard appears; type **Android** in the **Virtual machine name** field and click **Next**. Click **Browse** if you want to store the virtual hard disk in different location.



New Virtual Machine Wizard

**Name the Virtual Machine**

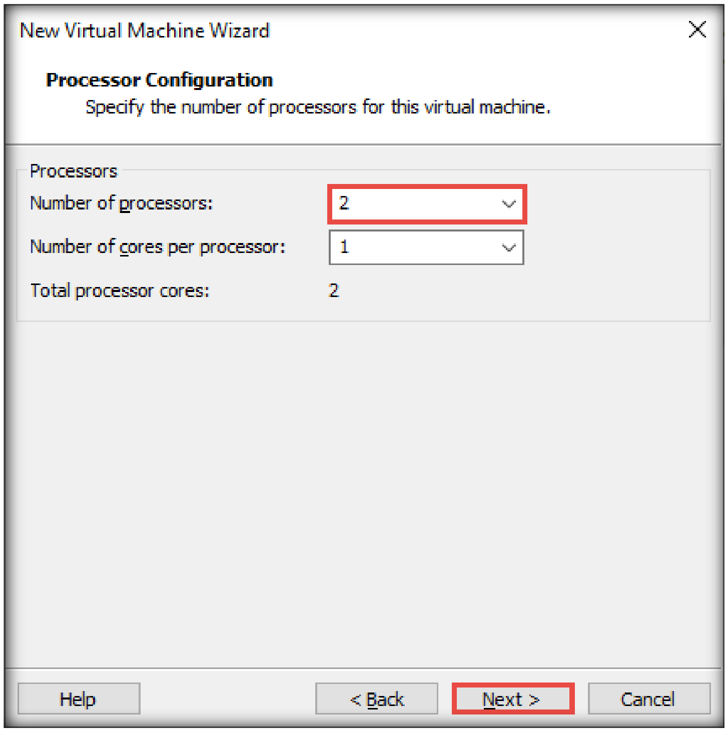
What name would you like to use for this virtual machine?

Virtual machine name: Android

Location: \Android

The default location can be changed at Edit > Preferences.

7. In the **Processor Configuration** wizard, choose **2** from the **Number of processors** drop-down menu and click **Next**.



New Virtual Machine Wizard

**Processor Configuration**

Specify the number of processors for this virtual machine.

Processors

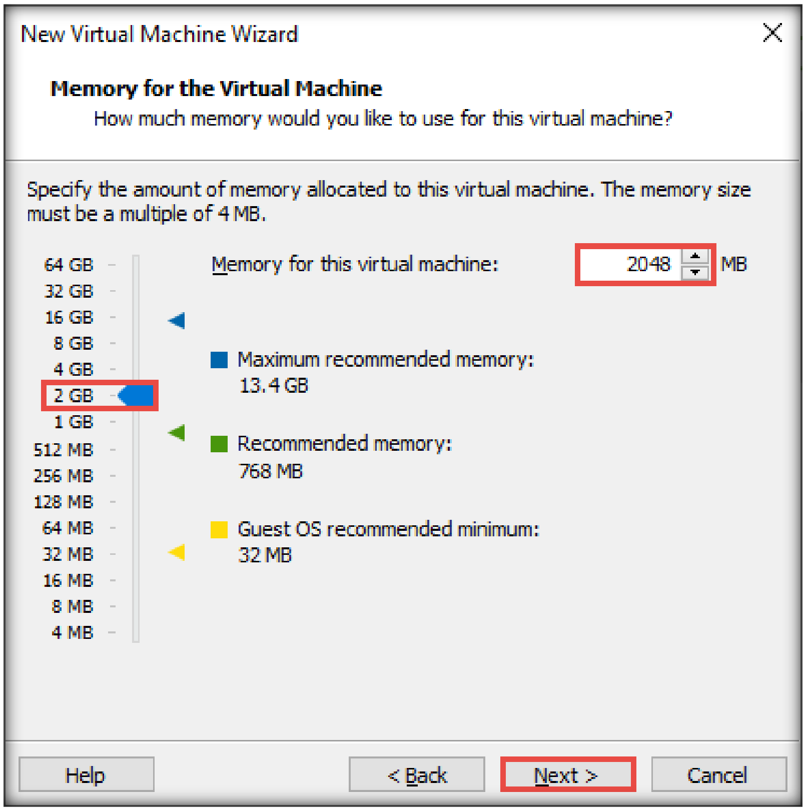
Number of processors: 2

Number of cores per processor: 1

Total processor cores: 2

Help
< Back
Next >
Cancel

8. In the **Memory for the Virtual Machine** wizard, type **2048** in the **Memory for this virtual machine** field or toggle the memory bar to **2 GB** and click **Next**.



New Virtual Machine Wizard

**Memory for the Virtual Machine**

How much memory would you like to use for this virtual machine?

Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.

Memory for this virtual machine: 2048 MB

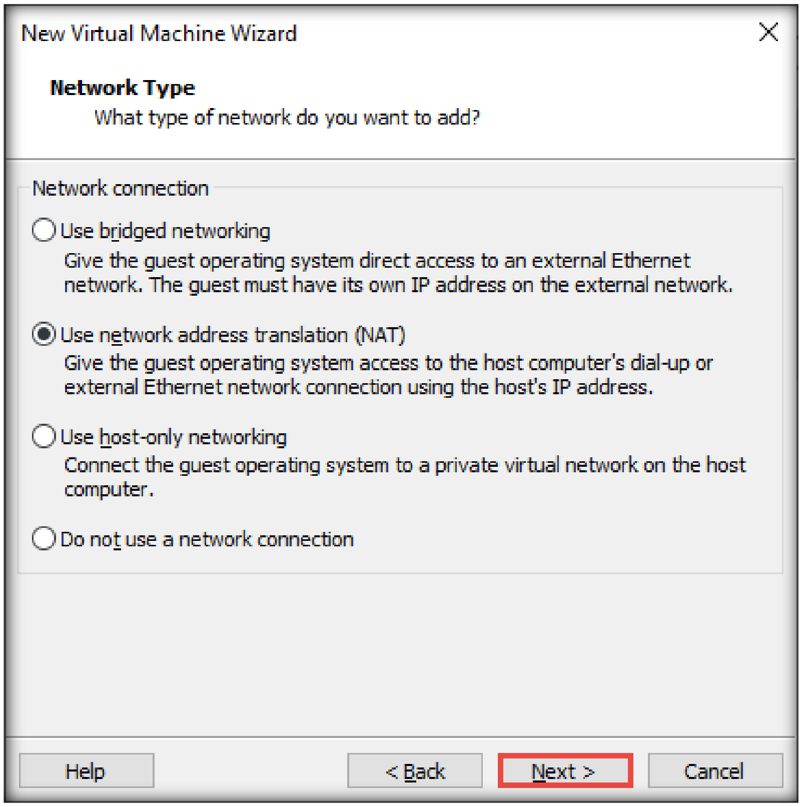
Maximum recommended memory: 13.4 GB

Recommended memory: 768 MB

Guest OS recommended minimum: 32 MB

64 GB
32 GB
16 GB
8 GB
4 GB
2 GB
1 GB
512 MB
256 MB
128 MB
64 MB
32 MB
16 MB
8 MB
4 MB
Help
< Back
Next >
Cancel

9. In the **Network Type** wizard, leave the default settings and click **Next**.



New Virtual Machine Wizard

**Network Type**

What type of network do you want to add?

Network connection

○ Use bridged networking

Give the guest operating system direct access to an external Ethernet network. The guest must have its own IP address on the external network.

● Use network address translation (NAT)

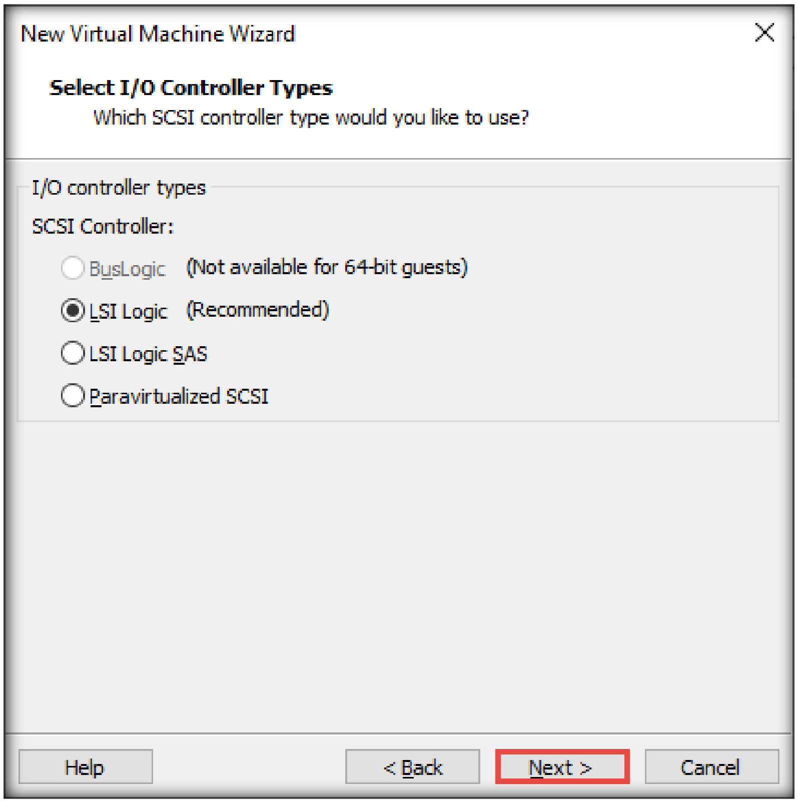
Give the guest operating system access to the host computer's dial-up or external Ethernet network connection using the host's IP address.

○ Use host-only networking

Connect the guest operating system to a private virtual network on the host computer.

○ Do not use a network connection

10. In the **Select I/O Controller Types** wizard, leave the default settings and click **Next**.



New Virtual Machine Wizard

**Select I/O Controller Types**

Which SCSI controller type would you like to use?

I/O controller types

SCSI Controller:

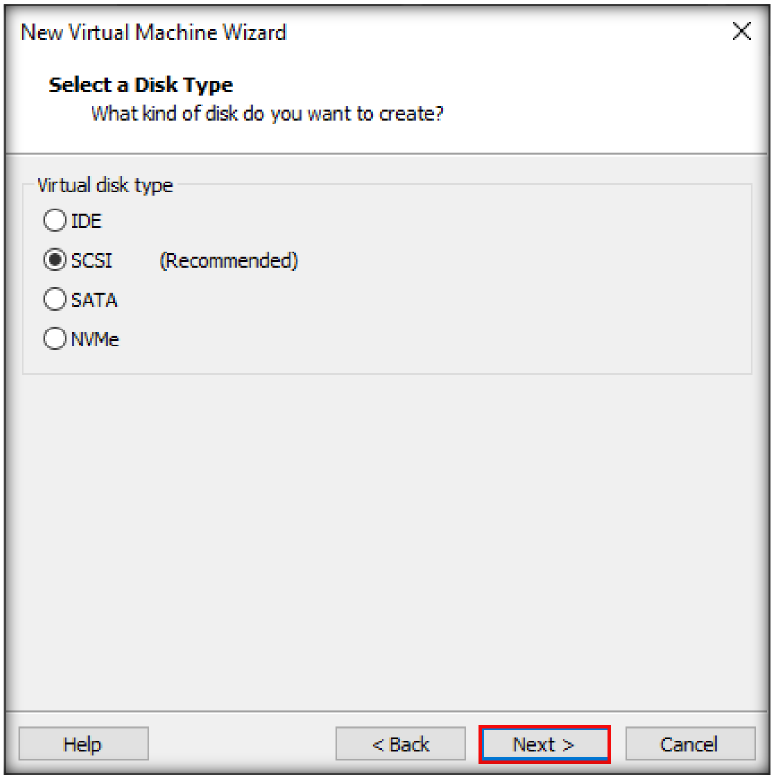
○ BusLogic (Not available for 64-bit guests)

● LSI Logic (Recommended)

○ LSI Logic SAS

○ Paravirtualized SCSI

11. In the **Select a Disk Type** wizard, leave the default settings and click **Next**.



New Virtual Machine Wizard

**Select a Disk Type**

What kind of disk do you want to create?

Virtual disk type

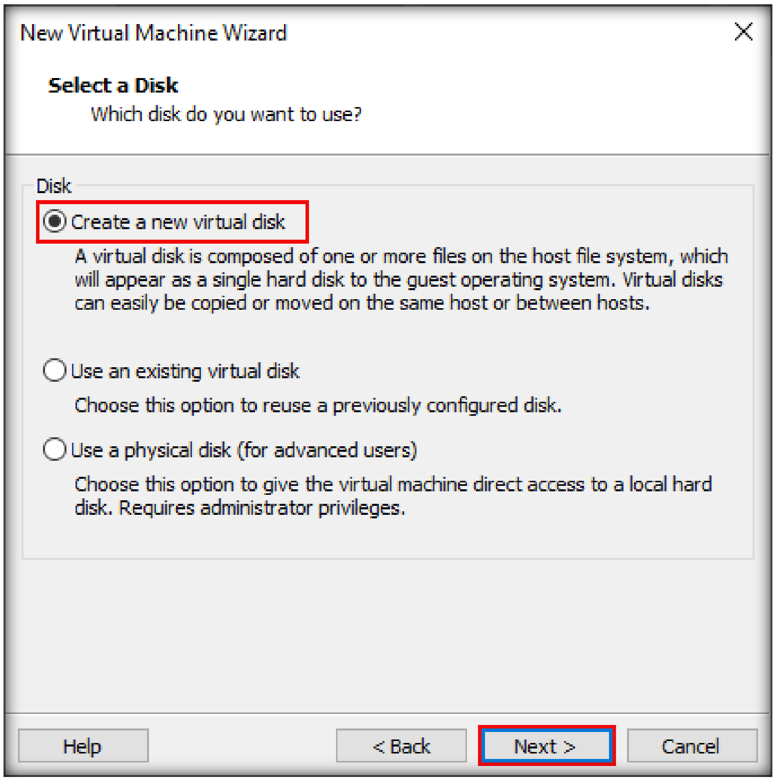
○ IDE

● SCSI (Recommended)

○ SATA

○ NVMe

12. In the **Select a Disk** wizard, choose the **Create a new virtual disk** radio button and click **Next**.



New Virtual Machine Wizard

**Select a Disk**

Which disk do you want to use?

Disk

● Create a new virtual disk

A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.

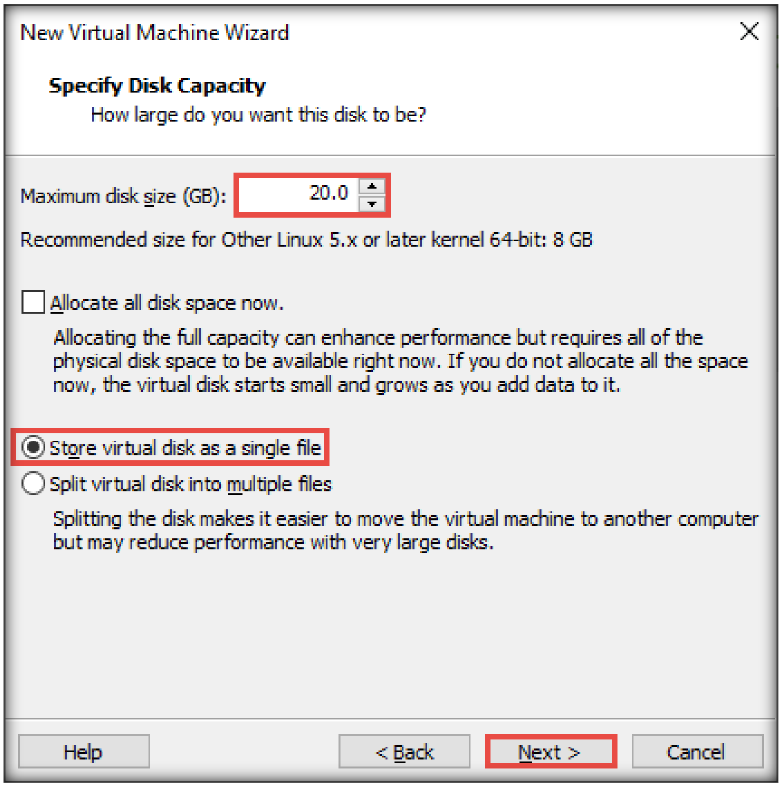
○ Use an existing virtual disk

Choose this option to reuse a previously configured disk.

○ Use a physical disk (for advanced users)

Choose this option to give the virtual machine direct access to a local hard disk. Requires administrator privileges.

13. The **Specify Disk Capacity** wizard appears; type **20.0** in the **Maximum disk size (GB)** field and choose the **Store virtual disk as a single file** radio button, and then click **Next**.



New Virtual Machine Wizard

**Specify Disk Capacity**

How large do you want this disk to be?

Maximum disk size (GB): 20.0

Recommended size for Other Linux 5.x or later kernel 64-bit: 8 GB

☐ Allocate all disk space now.

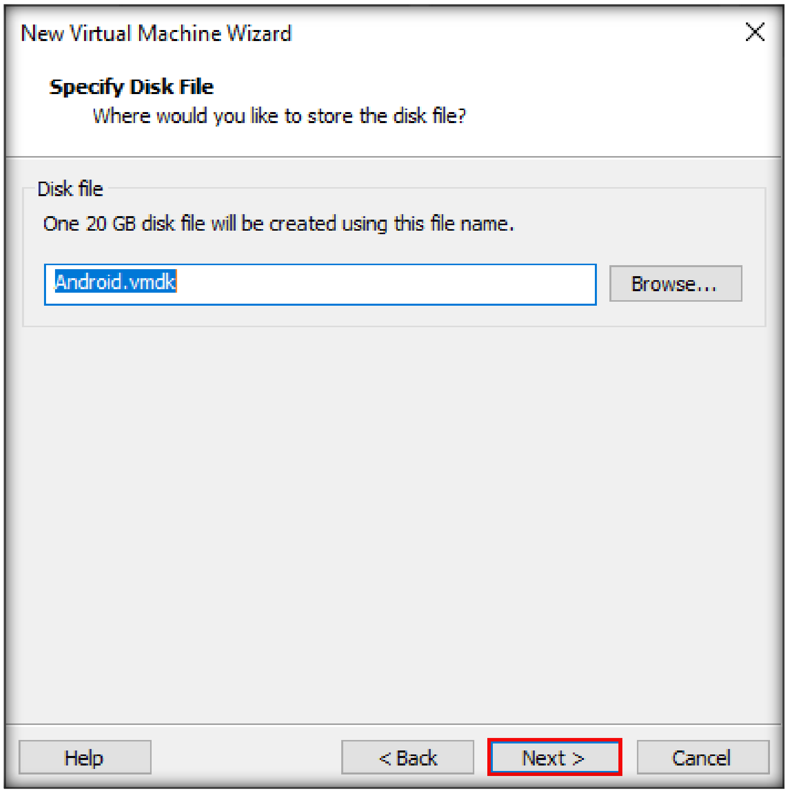
Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.

● Store virtual disk as a single file

○ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

14. In the **Specify Disk File** wizard, click **Next**.



New Virtual Machine Wizard

**Specify Disk File**

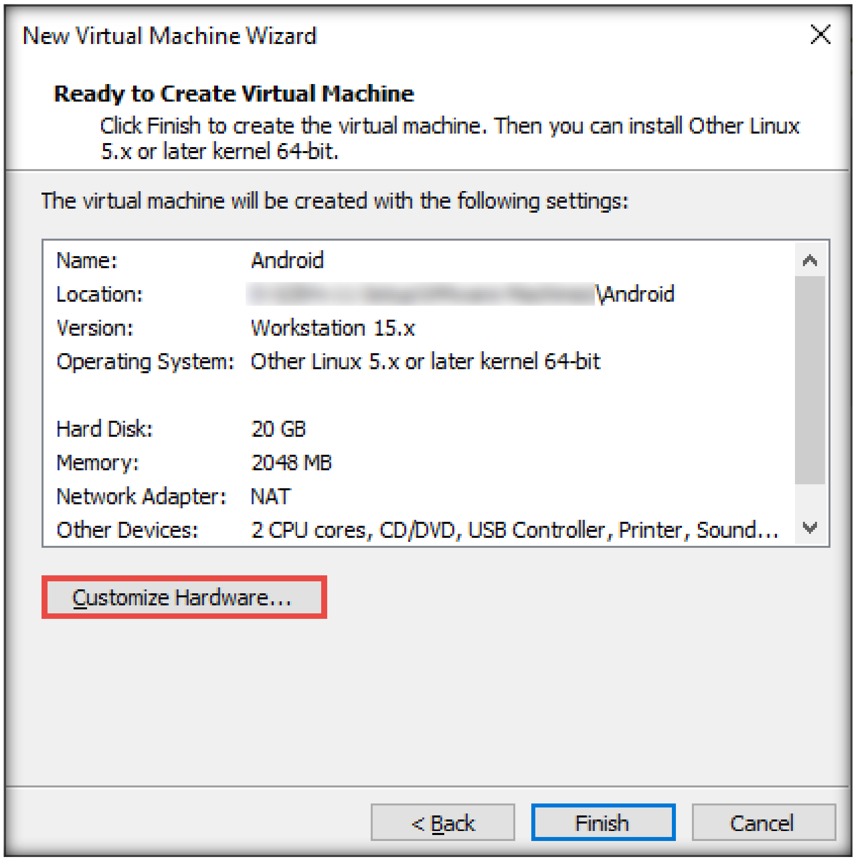
Where would you like to store the disk file?

Disk file

One 20 GB disk file will be created using this file name.

Android.vmdk

15. Click the **Customize Hardware** button in the **Ready to Create Virtual Machine** wizard.



New Virtual Machine Wizard

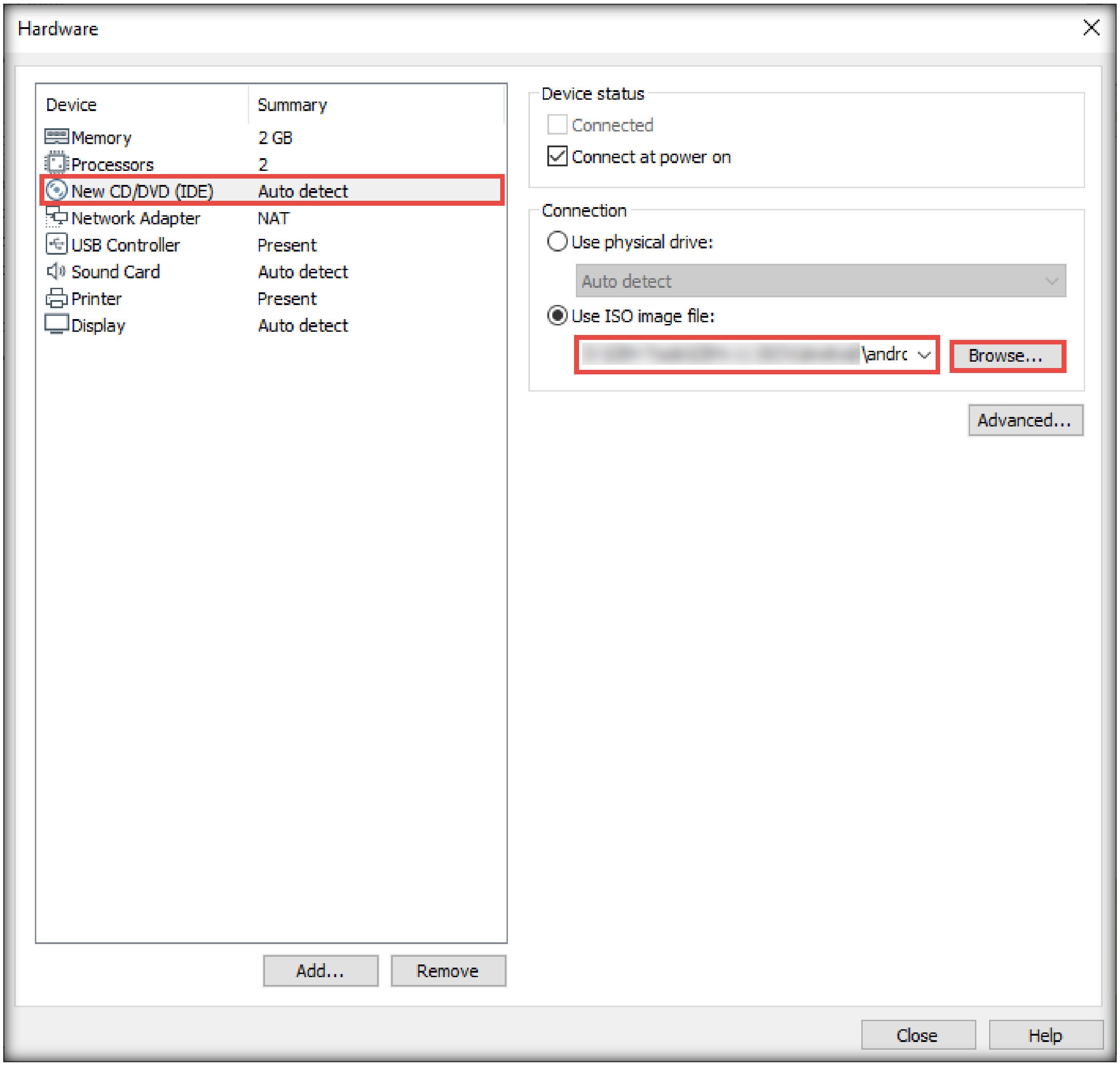
**Ready to Create Virtual Machine**

Click Finish to create the virtual machine. Then you can install Other Linux 5.x or later kernel 64-bit.

The virtual machine will be created with the following settings:

| | |
|---|---|
| Name: | Android |
| Location: | [redacted]\Android |
| Version: | Workstation 15.x |
| Operating System: | Other Linux 5.x or later kernel 64-bit |
| Hard Disk: | 20 GB |
| Memory: | 2048 MB |
| Network Adapter: | NAT |
| Other Devices: | 2 CPU cores, CD/DVD, USB Controller, Printer, Sound... |

16. The **Hardware** window appears; select the **New CD/DVD (IDE)** option from the left pane, and then select the **Use ISO image file** radio button. Click **Browse** to go to the location where you downloaded **CEHv11 ISO** and navigate to the **CEHv11 ISO\Android** folder. Select **android-x86_64-9.0-rc1.iso** to provide the ISO path and click **Display** in the left pane.



Hardware

| Device | Summary |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| New CD/DVD (IDE) | Auto detect |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

Device status

☐ Connected

☑ Connect at power on

Connection

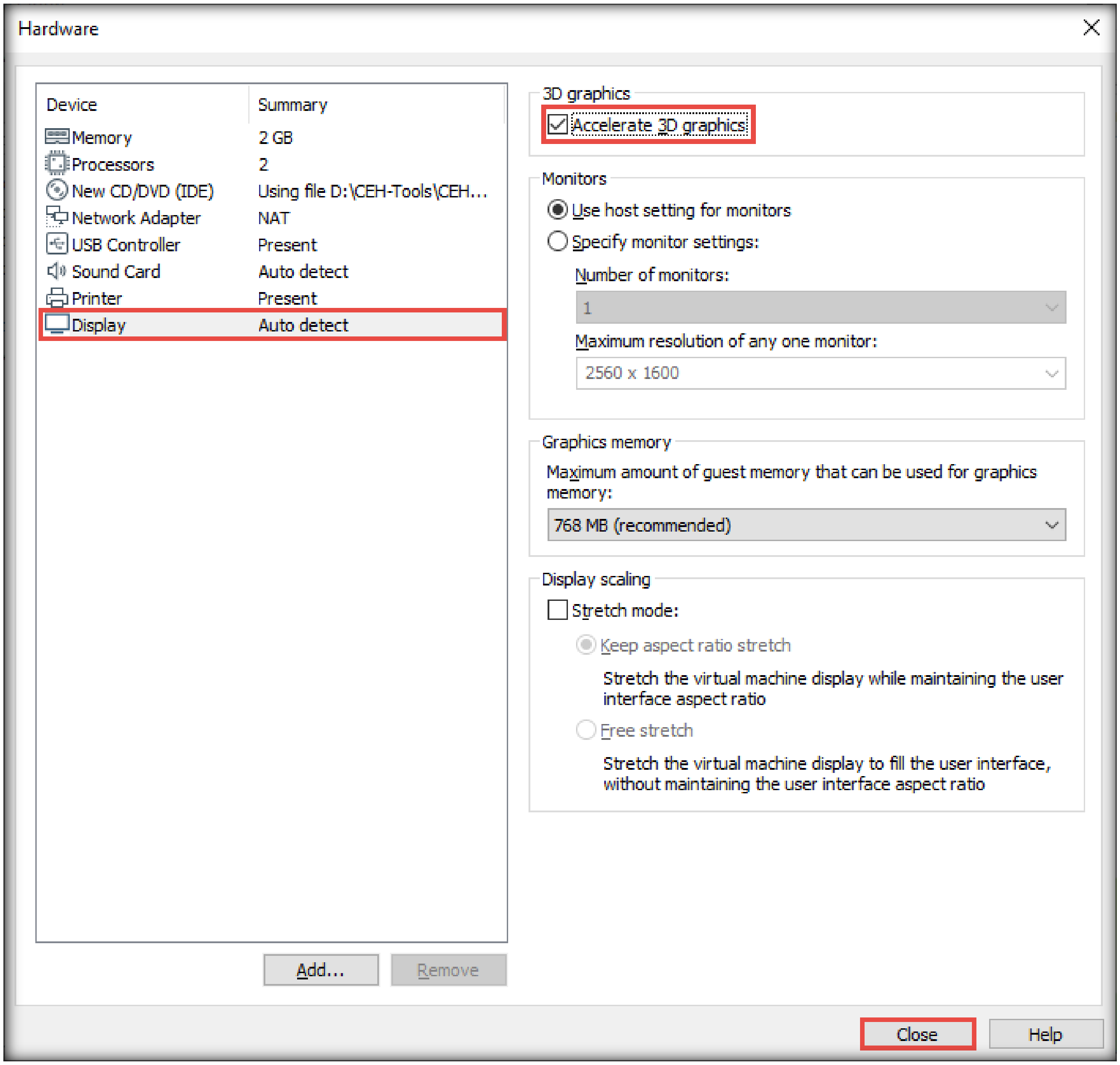
○ Use physical drive:

Auto detect

● Use ISO image file:

\andrc

17. In the **Display** settings, tick the **Accelerate 3D graphics** checkbox and click **Close**.



| Device | Summary |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| New CD/DVD (IDE) | Using file D:\CEH-Tools\CEH... |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

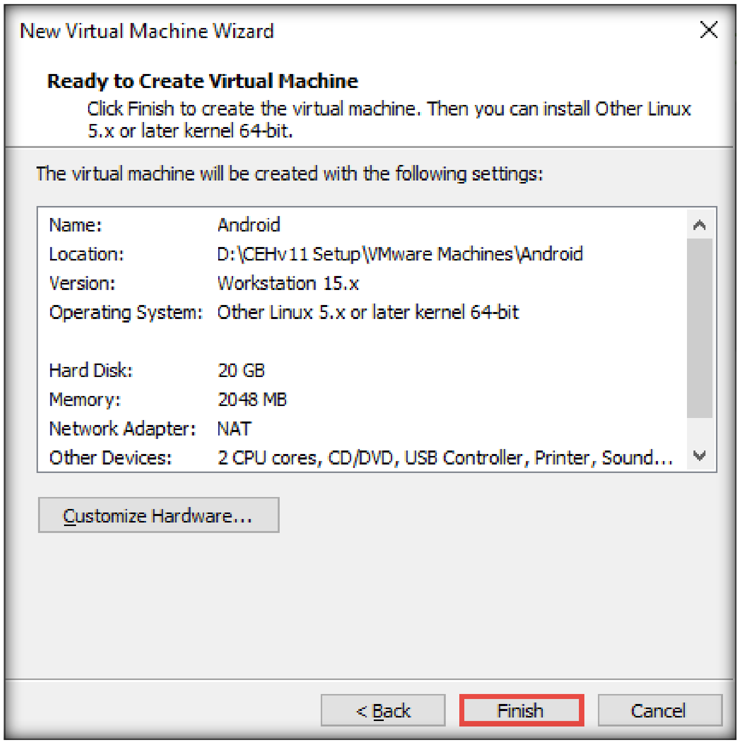
3D graphics
☑ Accelerate 3D graphics

Monitors
● Use host setting for monitors
○ Specify monitor settings:
Number of monitors: 1
Maximum resolution of any one monitor: 2560 x 1600

Graphics memory
Maximum amount of guest memory that can be used for graphics memory:
768 MB (recommended)

Display scaling
☐ Stretch mode:
● Keep aspect ratio stretch
Stretch the virtual machine display while maintaining the user interface aspect ratio
○ Free stretch
Stretch the virtual machine display to fill the user interface, without maintaining the user interface aspect ratio

18. Click **Finish** in the **Ready to Create Virtual Machine** wizard.


New Virtual Machine Wizard
Customize Hardware...
< Back
Finish
Cancel

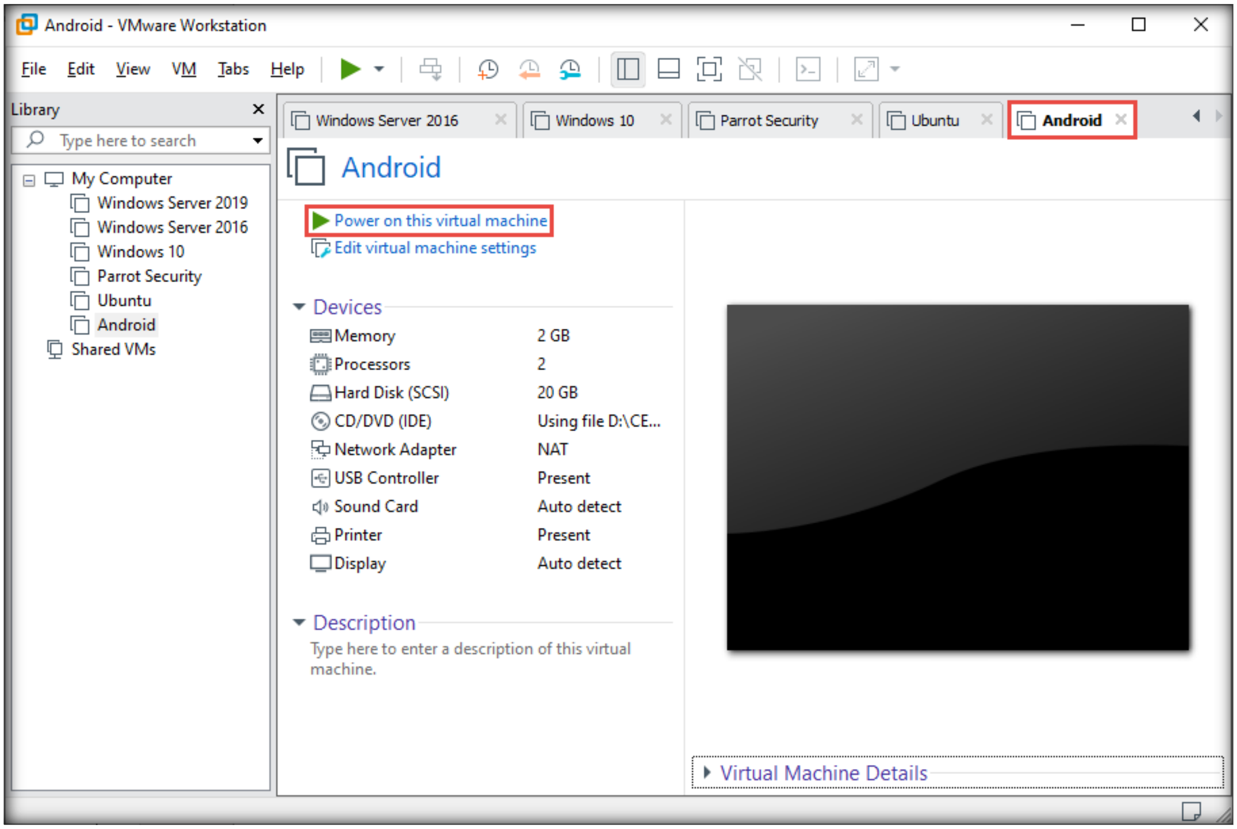
**Ready to Create Virtual Machine**

Click Finish to create the virtual machine. Then you can install Other Linux 5.x or later kernel 64-bit.

The virtual machine will be created with the following settings:

| | |
|---|---|
| Name: | Android |
| Location: | D:\CEHv11 Setup\VMware Machines\Android |
| Version: | Workstation 15.x |
| Operating System: | Other Linux 5.x or later kernel 64-bit |
| Hard Disk: | 20 GB |
| Memory: | 2048 MB |
| Network Adapter: | NAT |
| Other Devices: | 2 CPU cores, CD/DVD, USB Controller, Printer, Sound... |

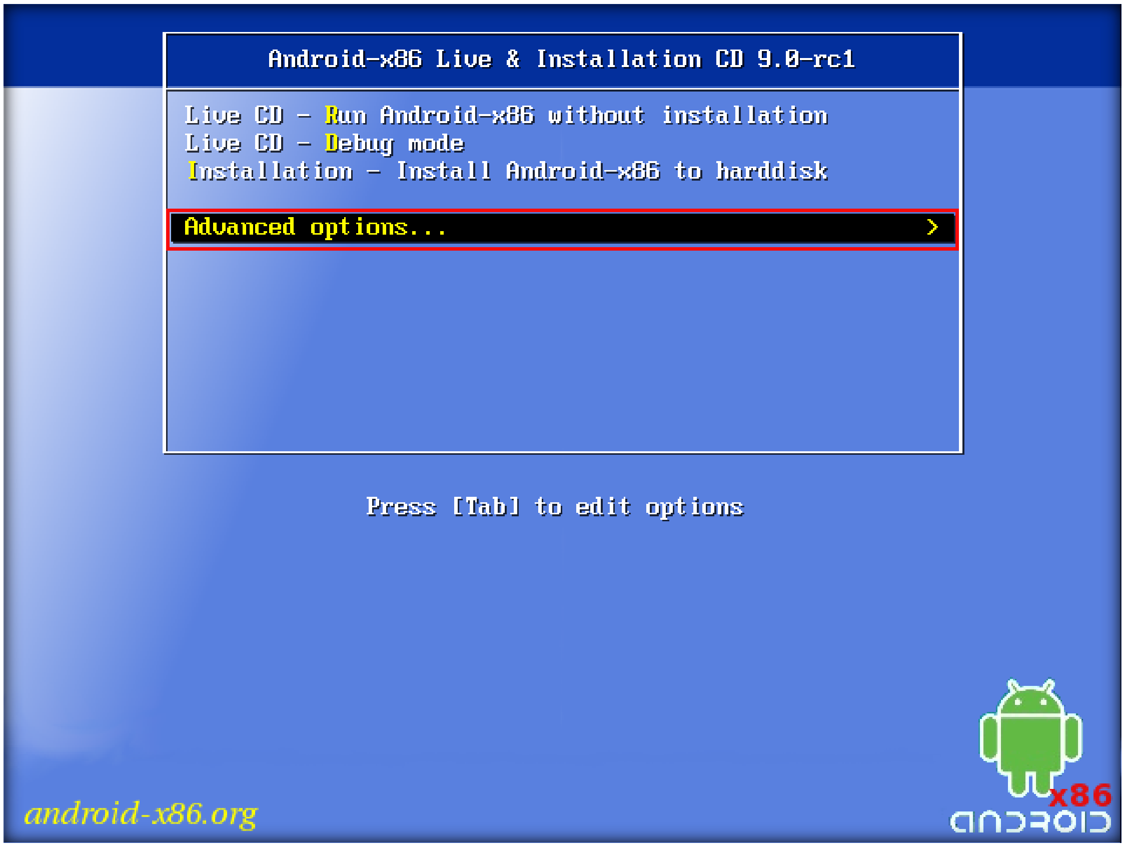
19. The Android machine is successfully created in the VMware; click **Power on this virtual machine**.


Android - VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Ubuntu
Android
Shared VMs
Windows Server 2016
Windows 10
Parrot Security
Ubuntu
Android
Android
Power on this virtual machine
Edit virtual machine settings
Devices
Description
Virtual Machine Details

| | |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| Hard Disk (SCSI) | 20 GB |
| CD/DVD (IDE) | Using file D:\CE... |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

Type here to enter a description of this virtual machine.

20. The Android virtual machine installation GUI appears on the screen; select **Advanced options...** and press **Enter**.



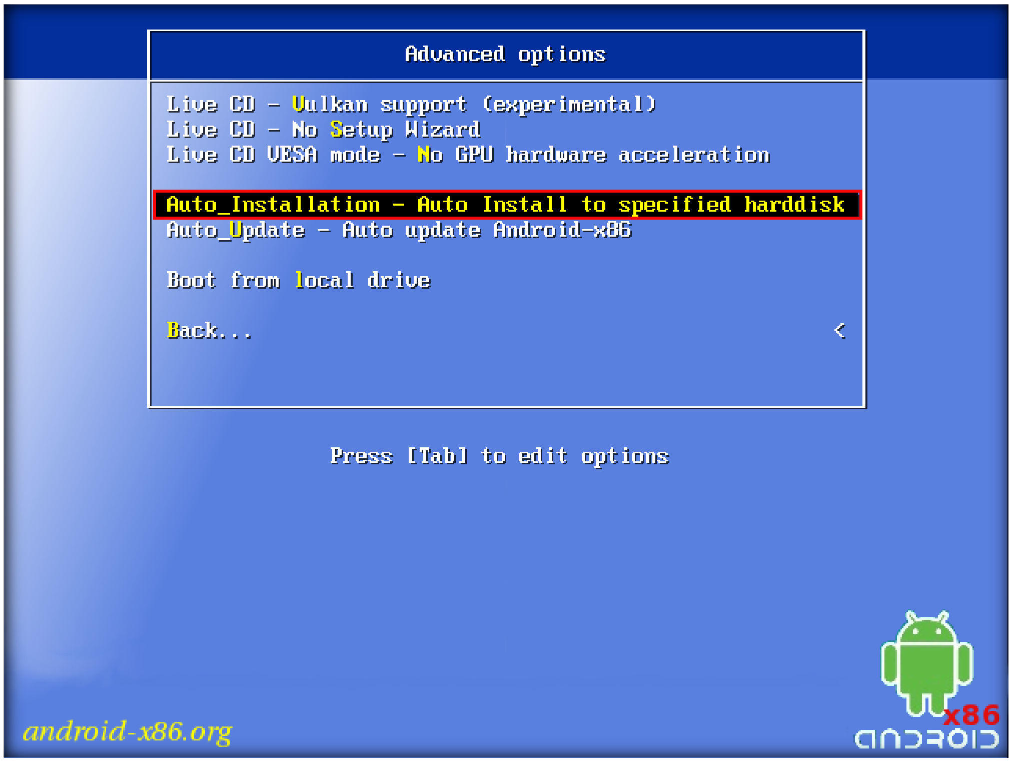
Android-x86 Live & Installation CD 9.0-rc1

Live CD - Run Android-x86 without installation
Live CD - Debug mode
Installation - Install Android-x86 to harddisk

Advanced options... >

Press [Tab] to edit options

21. In the **Advanced options** wizard, select the **Auto_Installation – Auto Install to specified harddisk** option and press **Enter**



Advanced options

Live CD - Vulkan support (experimental)
Live CD - No Setup Wizard
Live CD VESA mode - No GPU hardware acceleration

Auto_Installation - Auto Install to specified harddisk
Auto_Update - Auto update Android-x86

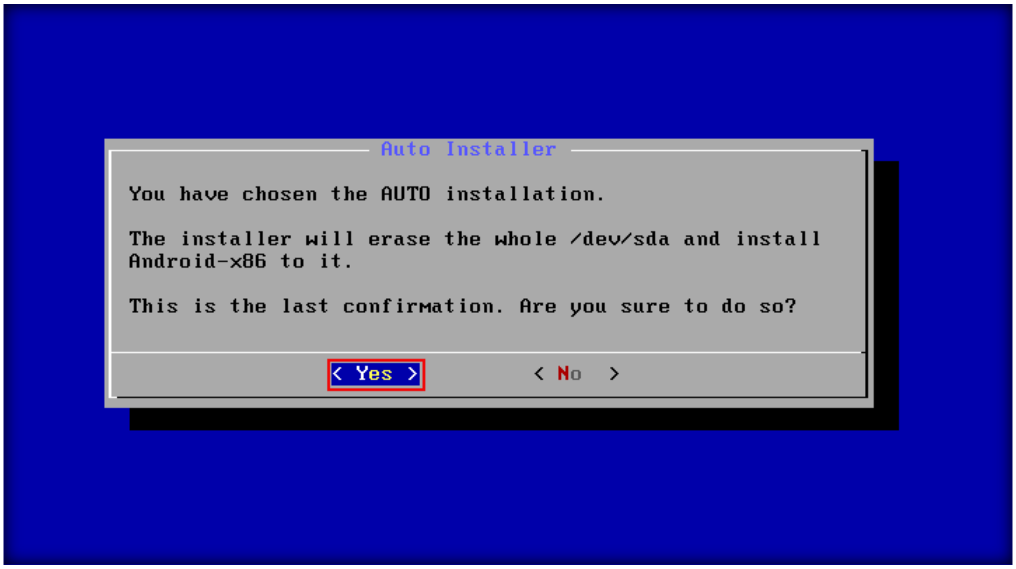
Boot from local drive

Back...

Press [Tab] to edit options

22. The **Auto Installer** screen appears; select **Yes**, and press **Enter**.

**Note**: Use the right and left arrows on your keyboard to navigate between Yes and No.



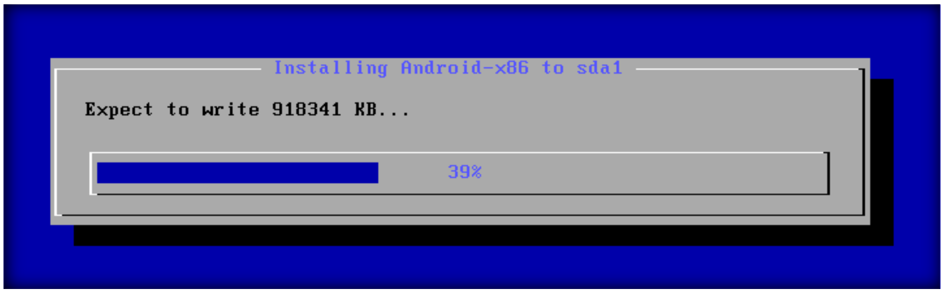
Auto Installer

You have chosen the AUTO installation.

The installer will erase the whole /dev/sda and install Android-x86 to it.

This is the last confirmation. Are you sure to do so?

23. The Android installation begins, as shown in the following screenshot



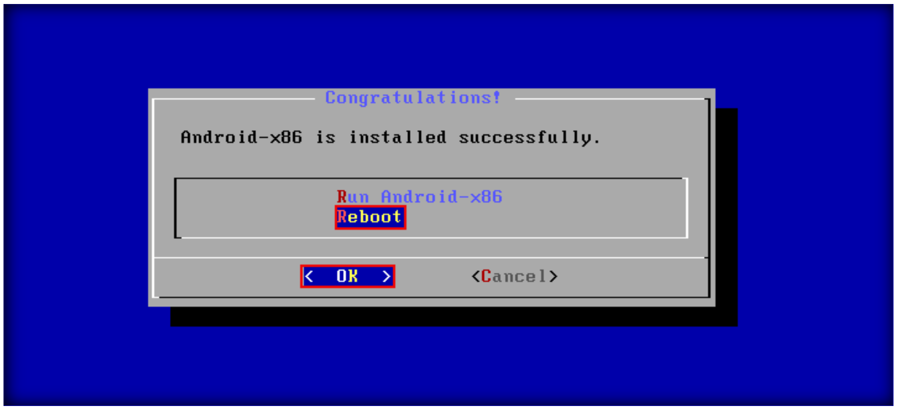
Installing Android-x86 to sda1

Expect to write 918341 KB...

39%

24. Once the image is created, the **Congratulations!** dialog box appears; select the **Reboot** option, and then select **OK** and press **Enter**.

**Note**: Use the up and down arrows to navigate between the options.

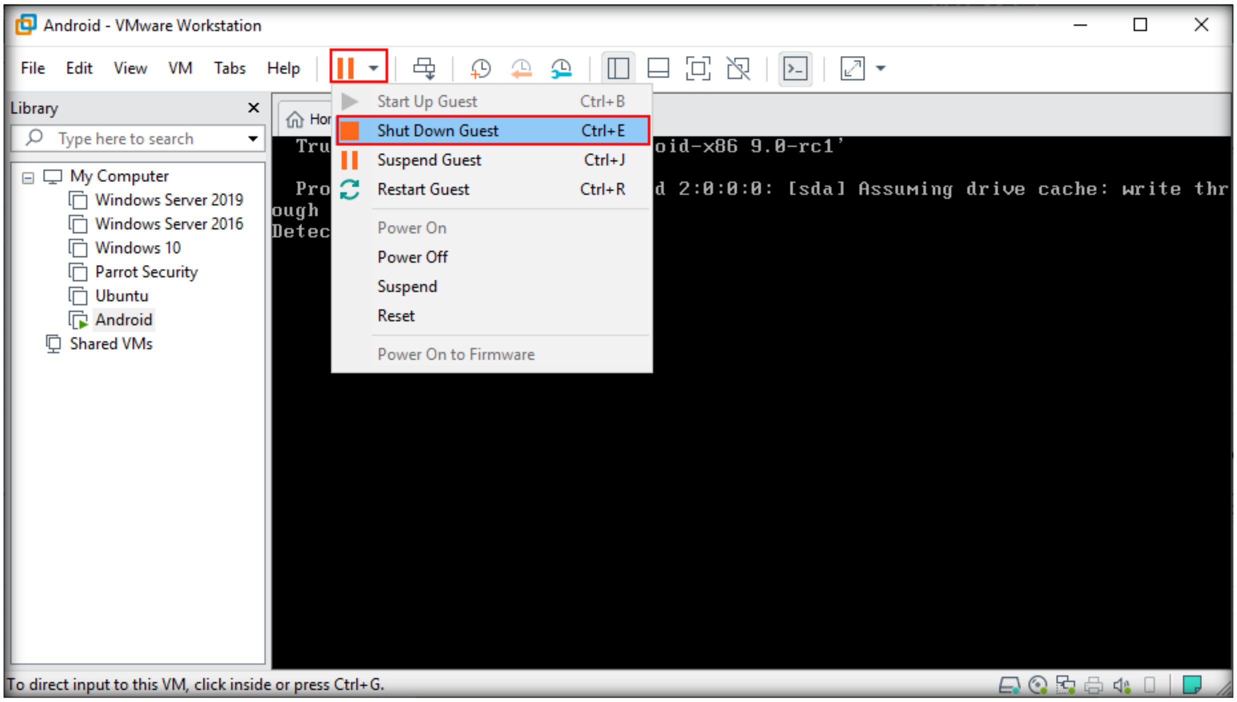


Congratulations!

Android-x86 is installed successfully.

Run Android-x86
Reboot
< OK >
<Cancel>

25. Once the machine has restarted, you will see a blank screen; click **Shut Down Guest**, as the screenshot shows.

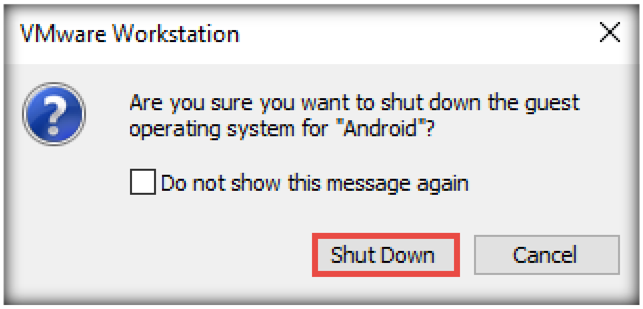


Android - VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Ubuntu
Android
Shared VMs
Hor
Start Up Guest Ctrl+B
Shut Down Guest Ctrl+E
Suspend Guest Ctrl+J
Restart Guest Ctrl+R
Power On
Power Off
Suspend
Reset
Power On to Firmware

```
Tru                                   oid-x86 9.0-rc1'

Pro                                   d 2:0:0:0: [sda] Assuming drive cache: write thr
ough
Detec
```

To direct input to this VM, click inside or press Ctrl+G.

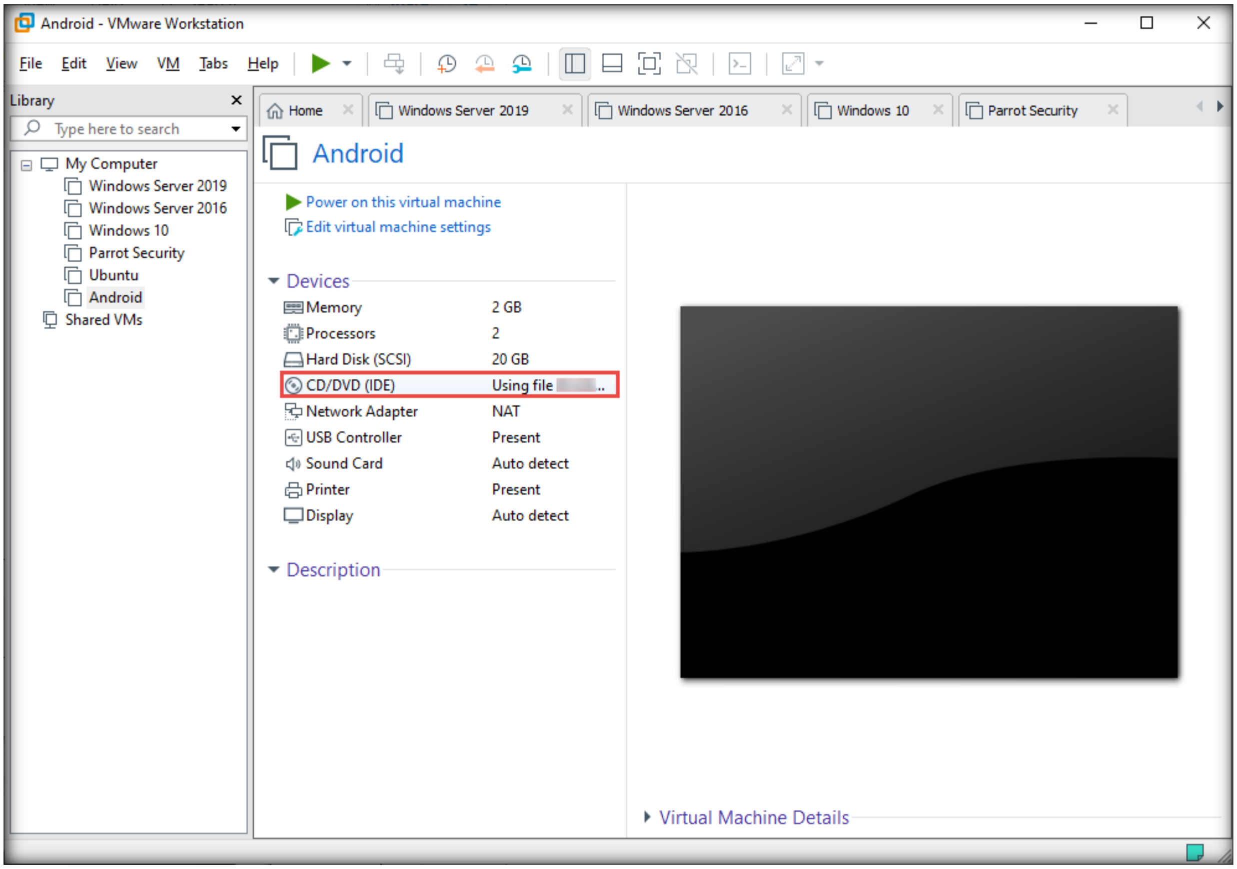
26. If the **VMware Workstation** pop-up window appears, click **Shut Down**.


VMware Workstation
Shut Down
Cancel

Are you sure you want to shut down the guest operating system for "Android"?

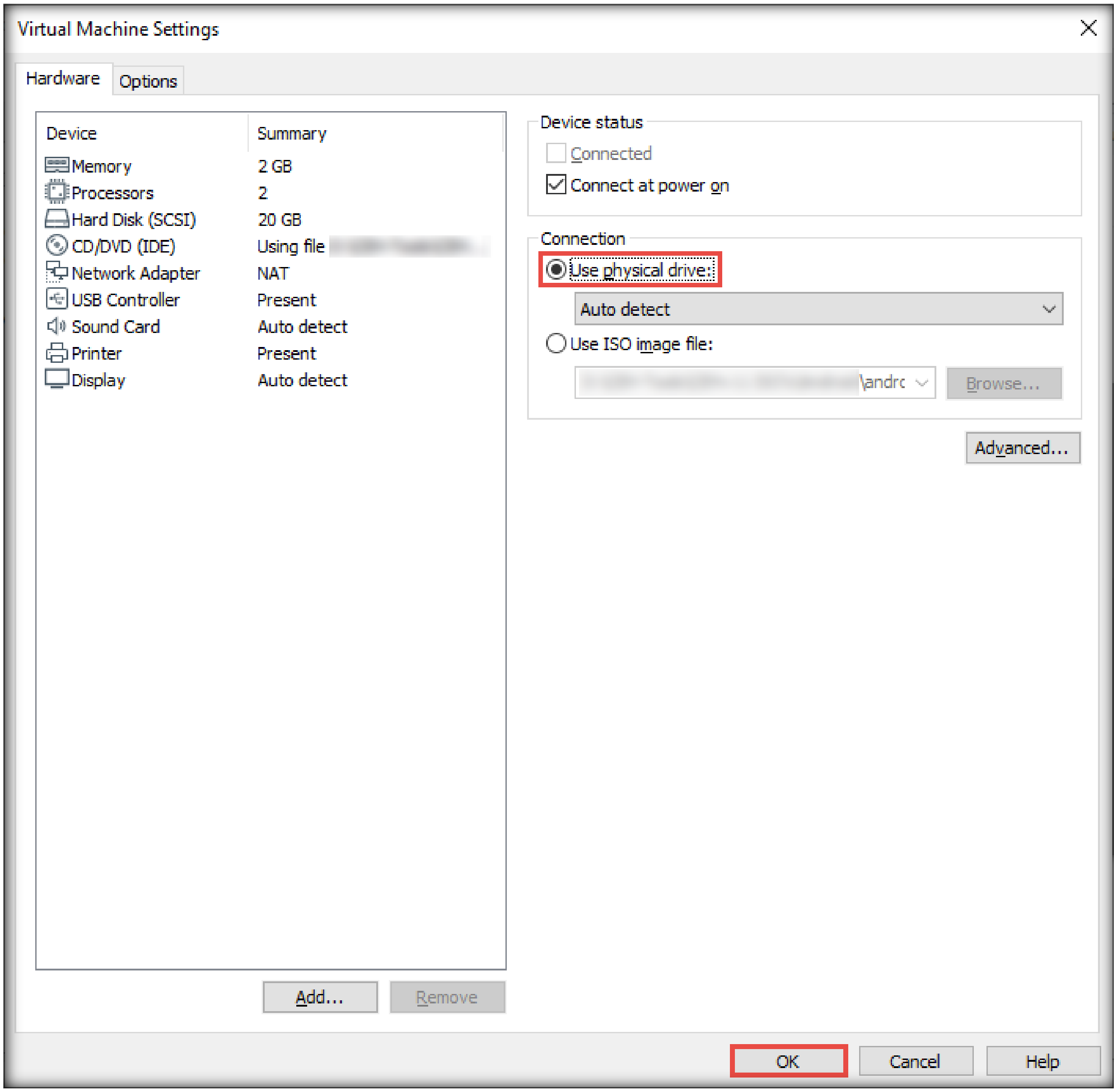
☐ Do not show this message again

27. Once the machine has shut down, click **CD/DVD (IDE)** under the **Devices** section, as the screenshot demonstrates.


Android - VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Ubuntu
Android
Shared VMs
Home
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Android
Power on this virtual machine
Edit virtual machine settings
Devices
Description
Virtual Machine Details

| | |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| Hard Disk (SCSI) | 20 GB |
| CD/DVD (IDE) | Using file [redacted].. |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

28. The **Virtual Machine Settings** window appears; choose the **Use physical drive** radio button from the right pane, and then click **OK**.



Virtual Machine Settings

| Device | Summary |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| Hard Disk (SCSI) | 20 GB |
| CD/DVD (IDE) | Using file [redacted] |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

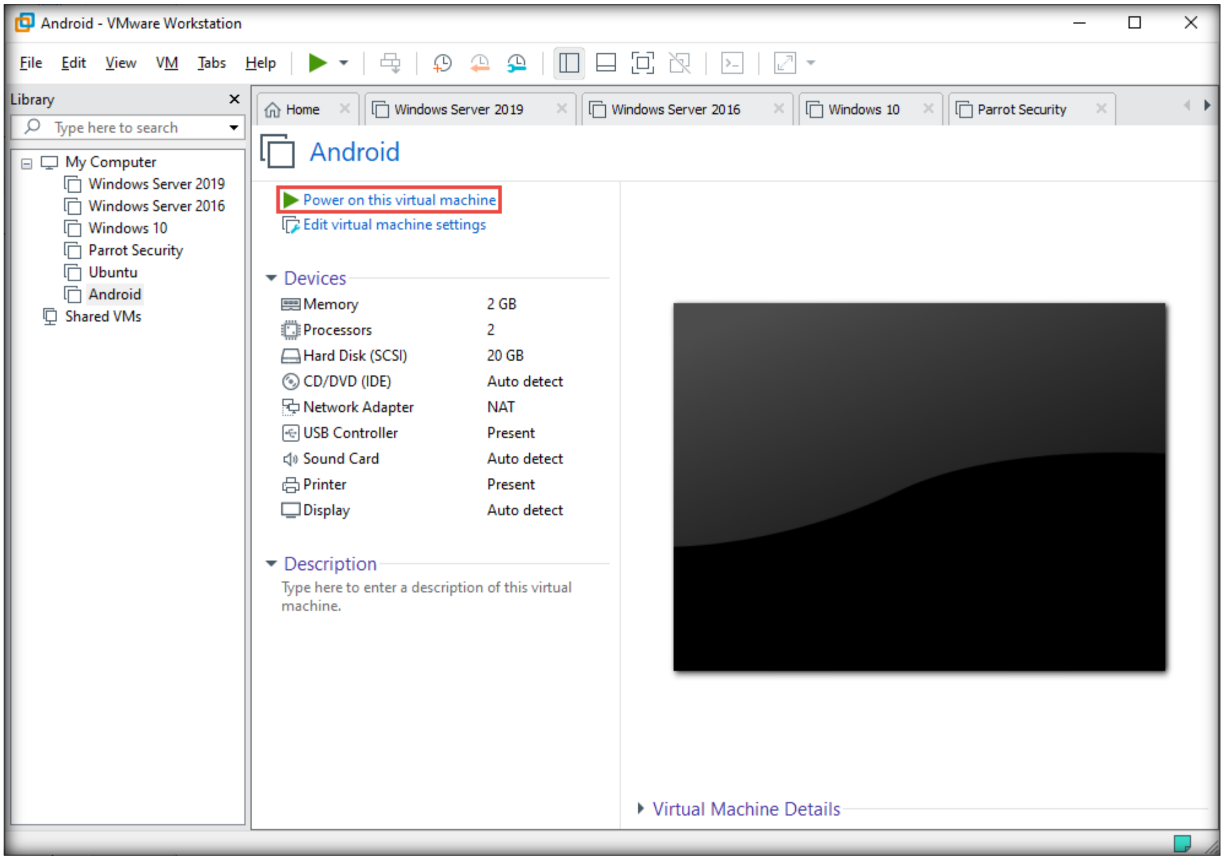
Device status
☐ Connected
☑ Connect at power on

Connection
● Use physical drive:
Auto detect
○ Use ISO image file:
[redacted]\andrc

×
Hardware
Options
Browse...
Advanced...
Add...
Remove
OK
Cancel
Help

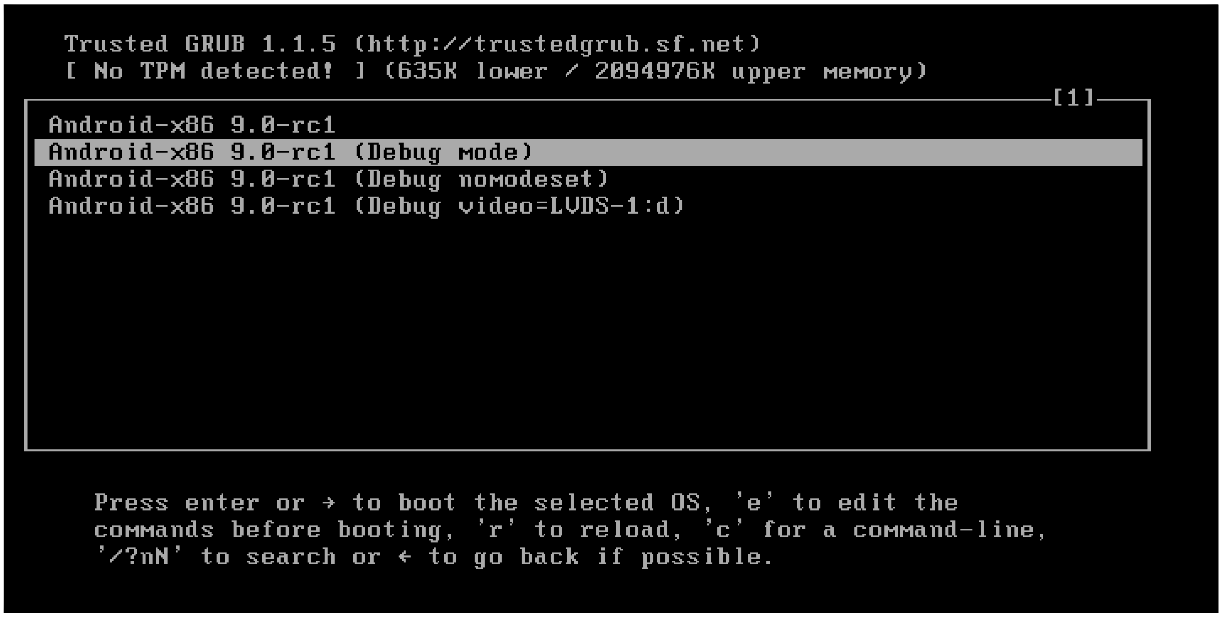
29. Once the settings are chosen, click **Power on this virtual machine**, as shown in the screenshot.

    **Note**: If an **Android – VMware Workstation** pop-up appears, click **Yes**.


Android - VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Ubuntu
Android
Shared VMs
Home
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Android
Power on this virtual machine
Edit virtual machine settings
Devices
Description
Type here to enter a description of this virtual machine.
Virtual Machine Details

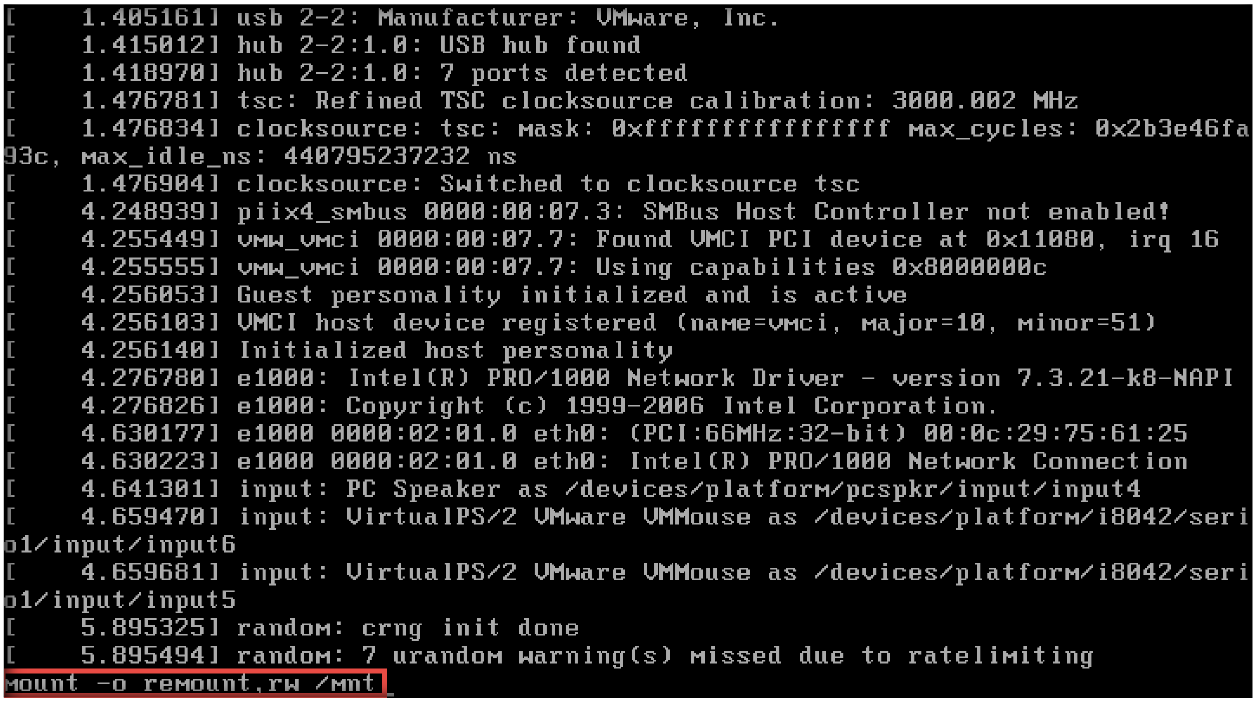
Memory 2 GB
Processors 2
Hard Disk (SCSI) 20 GB
CD/DVD (IDE) Auto detect
Network Adapter NAT
USB Controller Present
Sound Card Auto detect
Printer Present
Display Auto detect

30. The Android boot menu appears, select **Android-x86 9.0-rc1 (Debug mode)** and press **Enter**. Wait for 15 to 20 seconds for Android to load in the Debug mode.



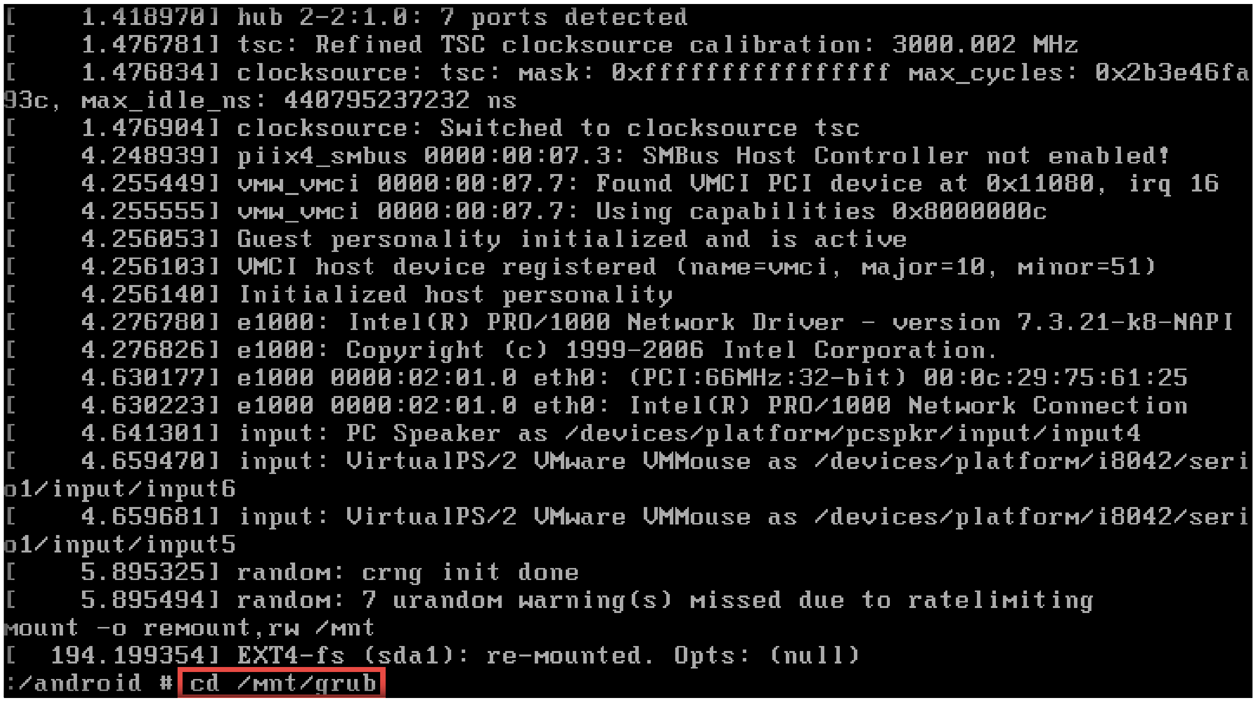
```
    Trusted GRUB 1.1.5 (http://trustedgrub.sf.net)
    [ No TPM detected! ] (635K lower / 2094976K upper memory)
                                                                        [1]
  Android-x86 9.0-rc1
  Android-x86 9.0-rc1 (Debug mode)
  Android-x86 9.0-rc1 (Debug nomodeset)
  Android-x86 9.0-rc1 (Debug video=LVDS-1:d)


      Press enter or → to boot the selected OS, 'e' to edit the
      commands before booting, 'r' to reload, 'c' for a command-line,
      '/?nN' to search or ← to go back if possible.
```

31. In the Debug mode, type **mount -o remount,rw /mnt**, and press **Enter**.



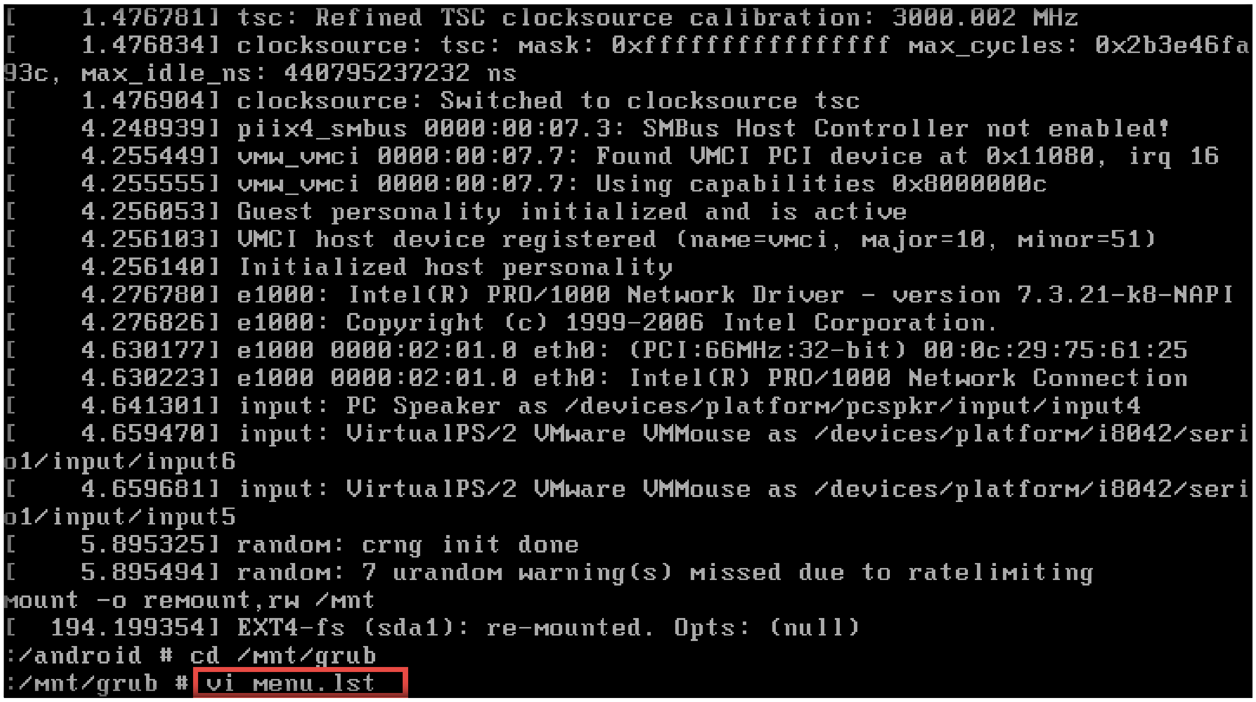
```
[    1.405161] usb 2-2: Manufacturer: VMware, Inc.
[    1.415012] hub 2-2:1.0: USB hub found
[    1.418970] hub 2-2:1.0: 7 ports detected
[    1.476781] tsc: Refined TSC clocksource calibration: 3000.002 MHz
[    1.476834] clocksource: tsc: mask: 0xffffffffffffffff max_cycles: 0x2b3e46fa
93c, max_idle_ns: 440795237232 ns
[    1.476904] clocksource: Switched to clocksource tsc
[    4.248939] piix4_smbus 0000:00:07.3: SMBus Host Controller not enabled!
[    4.255449] vmw_vmci 0000:00:07.7: Found VMCI PCI device at 0x11080, irq 16
[    4.255555] vmw_vmci 0000:00:07.7: Using capabilities 0x8000000c
[    4.256053] Guest personality initialized and is active
[    4.256103] VMCI host device registered (name=vmci, major=10, minor=51)
[    4.256140] Initialized host personality
[    4.276780] e1000: Intel(R) PRO/1000 Network Driver - version 7.3.21-k8-NAPI
[    4.276826] e1000: Copyright (c) 1999-2006 Intel Corporation.
[    4.630177] e1000 0000:02:01.0 eth0: (PCI:66MHz:32-bit) 00:0c:29:75:61:25
[    4.630223] e1000 0000:02:01.0 eth0: Intel(R) PRO/1000 Network Connection
[    4.641301] input: PC Speaker as /devices/platform/pcspkr/input/input4
[    4.659470] input: VirtualPS/2 VMware VMMouse as /devices/platform/i8042/seri
o1/input/input6
[    4.659681] input: VirtualPS/2 VMware VMMouse as /devices/platform/i8042/seri
o1/input/input5
[    5.895325] random: crng init done
[    5.895494] random: 7 urandom warning(s) missed due to ratelimiting
mount -o remount,rw /mnt_
```

32. Change the directory by typing **cd /mnt/grub** and pressing **Enter**.



```
[    1.418970] hub 2-2:1.0: 7 ports detected
[    1.476781] tsc: Refined TSC clocksource calibration: 3000.002 MHz
[    1.476834] clocksource: tsc: mask: 0xffffffffffffffff max_cycles: 0x2b3e46fa
93c, max_idle_ns: 440795237232 ns
[    1.476904] clocksource: Switched to clocksource tsc
[    4.248939] piix4_smbus 0000:00:07.3: SMBus Host Controller not enabled!
[    4.255449] vmw_vmci 0000:00:07.7: Found VMCI PCI device at 0x11080, irq 16
[    4.255555] vmw_vmci 0000:00:07.7: Using capabilities 0x8000000c
[    4.256053] Guest personality initialized and is active
[    4.256103] VMCI host device registered (name=vmci, major=10, minor=51)
[    4.256140] Initialized host personality
[    4.276780] e1000: Intel(R) PRO/1000 Network Driver - version 7.3.21-k8-NAPI
[    4.276826] e1000: Copyright (c) 1999-2006 Intel Corporation.
[    4.630177] e1000 0000:02:01.0 eth0: (PCI:66MHz:32-bit) 00:0c:29:75:61:25
[    4.630223] e1000 0000:02:01.0 eth0: Intel(R) PRO/1000 Network Connection
[    4.641301] input: PC Speaker as /devices/platform/pcspkr/input/input4
[    4.659470] input: VirtualPS/2 VMware VMMouse as /devices/platform/i8042/seri
o1/input/input6
[    4.659681] input: VirtualPS/2 VMware VMMouse as /devices/platform/i8042/seri
o1/input/input5
[    5.895325] random: crng init done
[    5.895494] random: 7 urandom warning(s) missed due to ratelimiting
mount -o remount,rw /mnt
[  194.199354] EXT4-fs (sda1): re-mounted. Opts: (null)
:/android # cd /mnt/grub
```

33. Type **vi menu.lst** and press **Enter** to edit the menu.lst file.

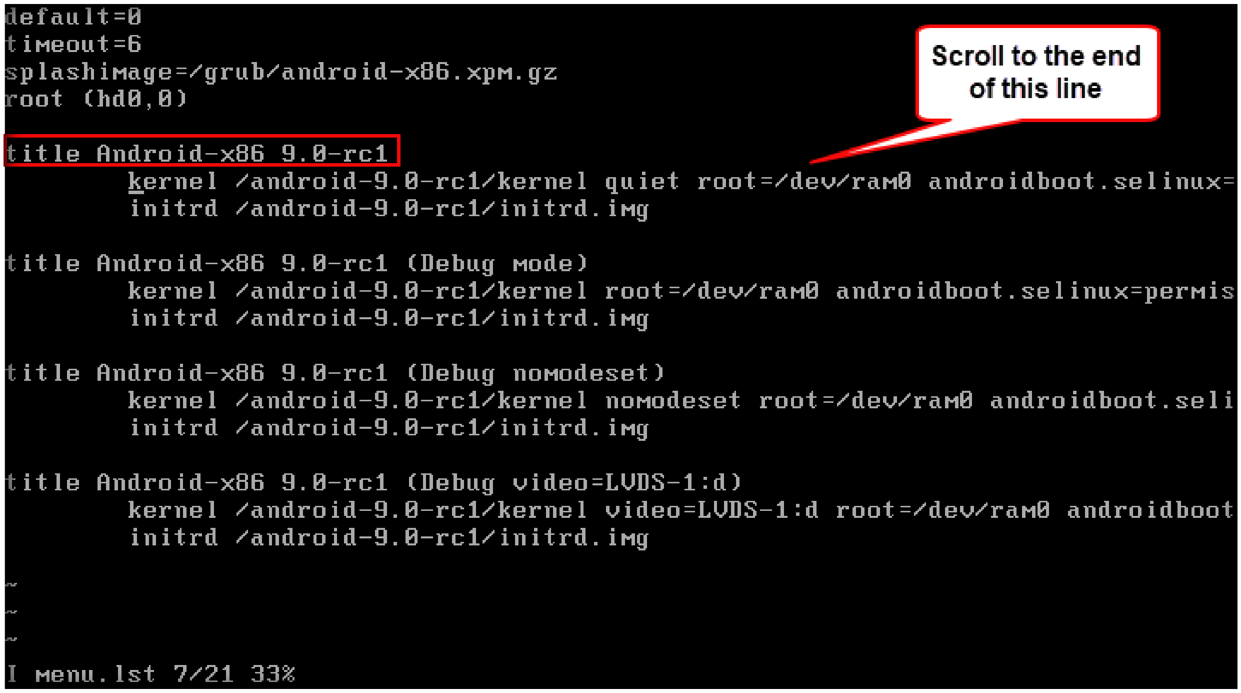


```
[    1.476781] tsc: Refined TSC clocksource calibration: 3000.002 MHz
[    1.476834] clocksource: tsc: mask: 0xffffffffffffffff max_cycles: 0x2b3e46fa
93c, max_idle_ns: 440795237232 ns
[    1.476904] clocksource: Switched to clocksource tsc
[    4.248939] piix4_smbus 0000:00:07.3: SMBus Host Controller not enabled!
[    4.255449] vmw_vmci 0000:00:07.7: Found VMCI PCI device at 0x11080, irq 16
[    4.255555] vmw_vmci 0000:00:07.7: Using capabilities 0x8000000c
[    4.256053] Guest personality initialized and is active
[    4.256103] VMCI host device registered (name=vmci, major=10, minor=51)
[    4.256140] Initialized host personality
[    4.276780] e1000: Intel(R) PRO/1000 Network Driver - version 7.3.21-k8-NAPI
[    4.276826] e1000: Copyright (c) 1999-2006 Intel Corporation.
[    4.630177] e1000 0000:02:01.0 eth0: (PCI:66MHz:32-bit) 00:0c:29:75:61:25
[    4.630223] e1000 0000:02:01.0 eth0: Intel(R) PRO/1000 Network Connection
[    4.641301] input: PC Speaker as /devices/platform/pcspkr/input/input4
[    4.659470] input: VirtualPS/2 VMware VMMouse as /devices/platform/i8042/seri
o1/input/input6
[    4.659681] input: VirtualPS/2 VMware VMMouse as /devices/platform/i8042/seri
o1/input/input5
[    5.895325] random: crng init done
[    5.895494] random: 7 urandom warning(s) missed due to ratelimiting
mount -o remount,rw /mnt
[  194.199354] EXT4-fs (sda1): re-mounted. Opts: (null)
:/android # cd /mnt/grub
:/mnt/grub # vi menu.lst
```

34. The menu.lst file opens in vi editor; press **Shift+A** on your keyboard to start editing the file.

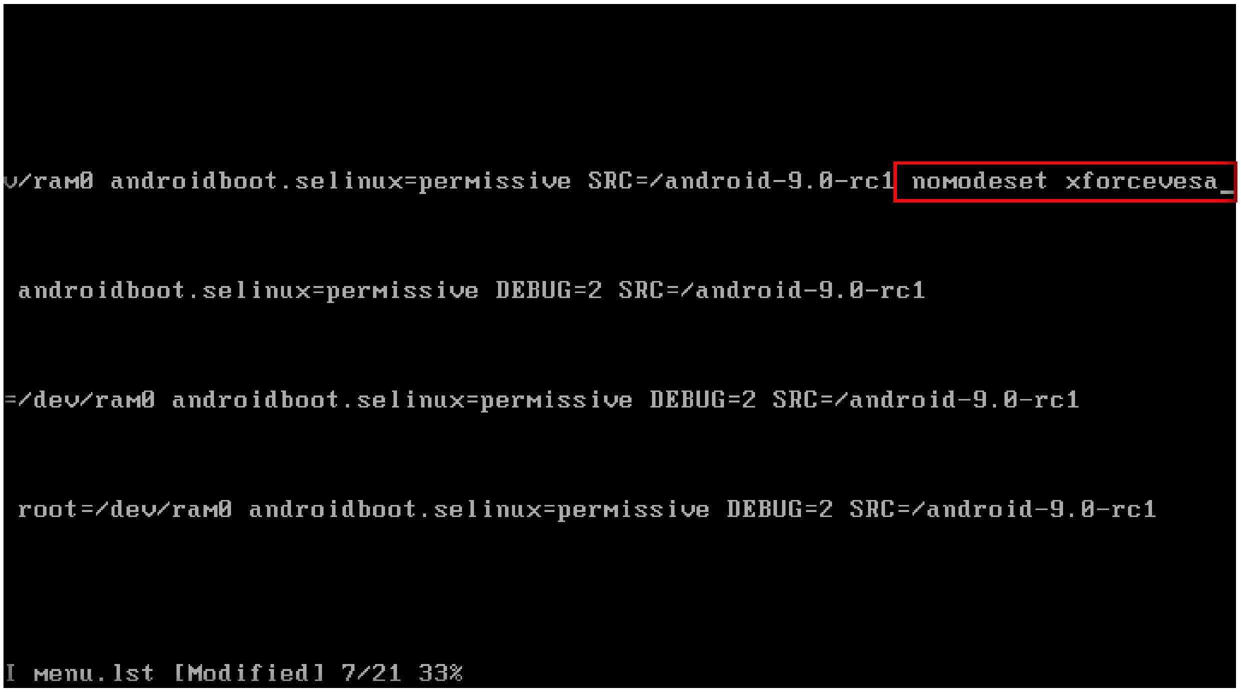
35. Navigate to the first line under **title Android-x86 9.0-rc1** and scroll to the extreme to end of this line.

36. At the end of the line, enter a space, type **nomodeset xforcevesa**, and press the **Esc** button on your keyboard.



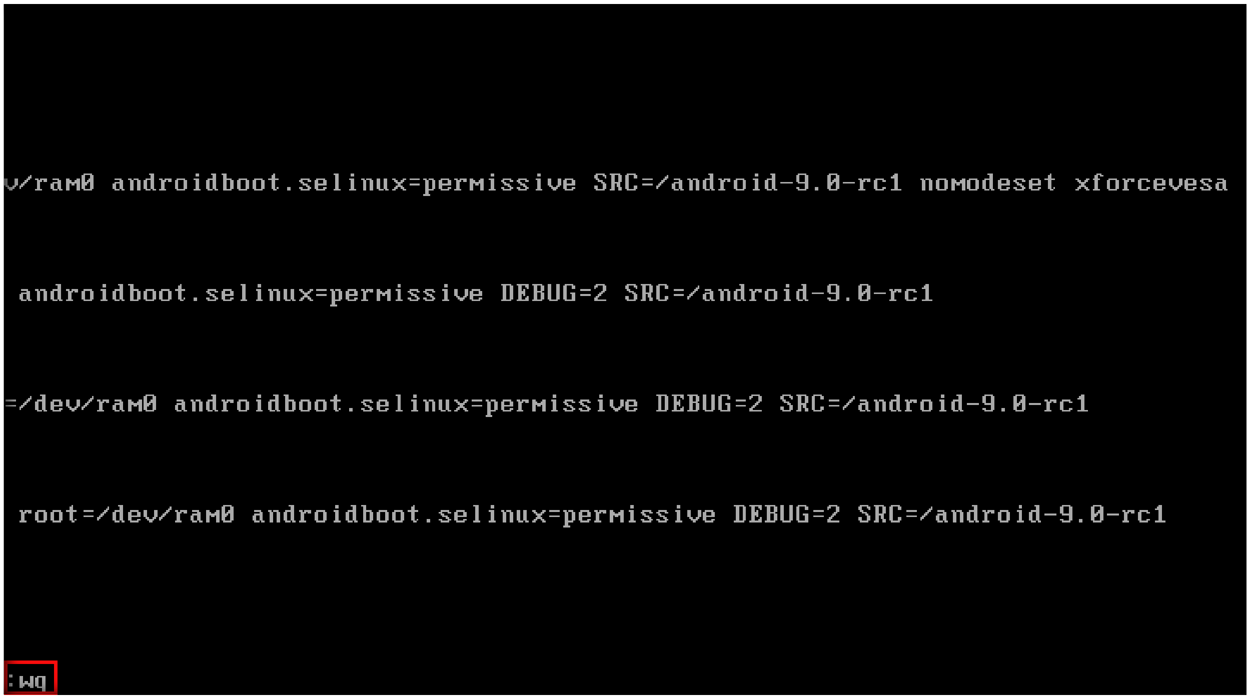
Scroll to the end of this line

```
default=0
timeout=6
splashimage=/grub/android-x86.xpm.gz
root (hd0,0)

title Android-x86 9.0-rc1
        kernel /android-9.0-rc1/kernel quiet root=/dev/ram0 androidboot.selinux=
        initrd /android-9.0-rc1/initrd.img

title Android-x86 9.0-rc1 (Debug mode)
        kernel /android-9.0-rc1/kernel root=/dev/ram0 androidboot.selinux=permis
        initrd /android-9.0-rc1/initrd.img

title Android-x86 9.0-rc1 (Debug nomodeset)
        kernel /android-9.0-rc1/kernel nomodeset root=/dev/ram0 androidboot.seli
        initrd /android-9.0-rc1/initrd.img

title Android-x86 9.0-rc1 (Debug video=LVDS-1:d)
        kernel /android-9.0-rc1/kernel video=LVDS-1:d root=/dev/ram0 androidboot
        initrd /android-9.0-rc1/initrd.img

~
~
~
I menu.lst 7/21 33%
```



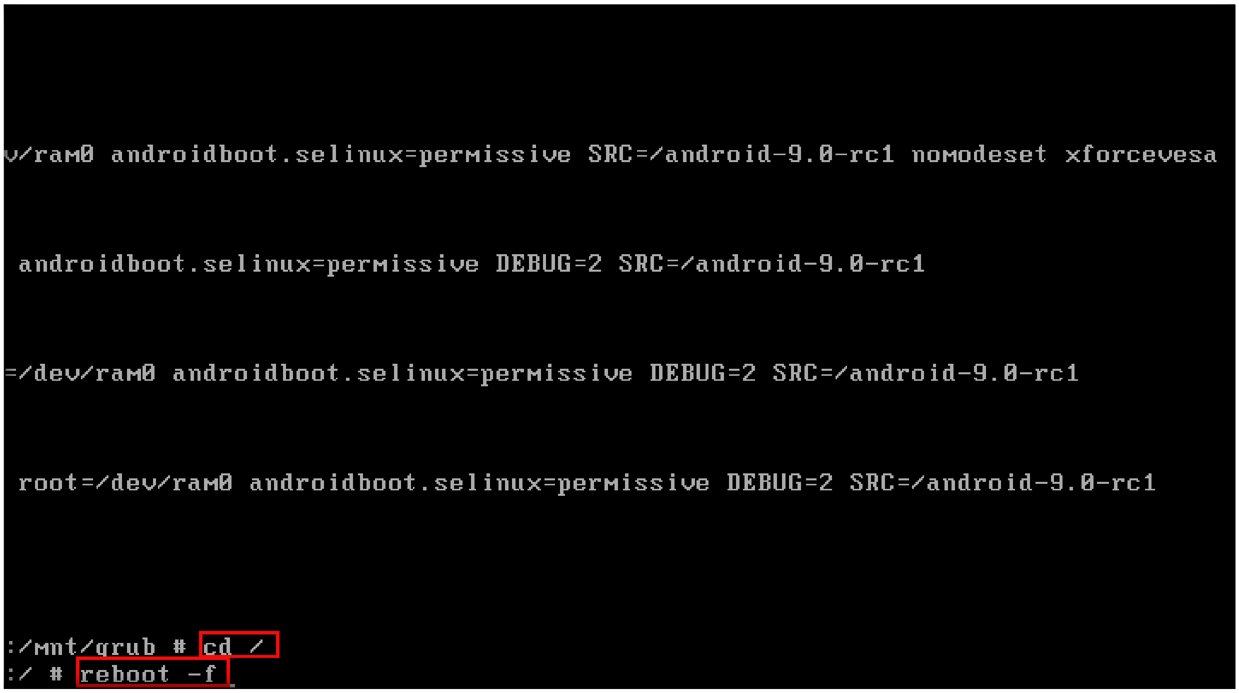
```
v/ram0 androidboot.selinux=permissive SRC=/android-9.0-rc1 nomodeset xforcevesa_

 androidboot.selinux=permissive DEBUG=2 SRC=/android-9.0-rc1

=/dev/ram0 androidboot.selinux=permissive DEBUG=2 SRC=/android-9.0-rc1

 root=/dev/ram0 androidboot.selinux=permissive DEBUG=2 SRC=/android-9.0-rc1


I menu.lst [Modified] 7/21 33%
```

37. Type **:wq** and press **Enter** to write and quit from the vi editor.



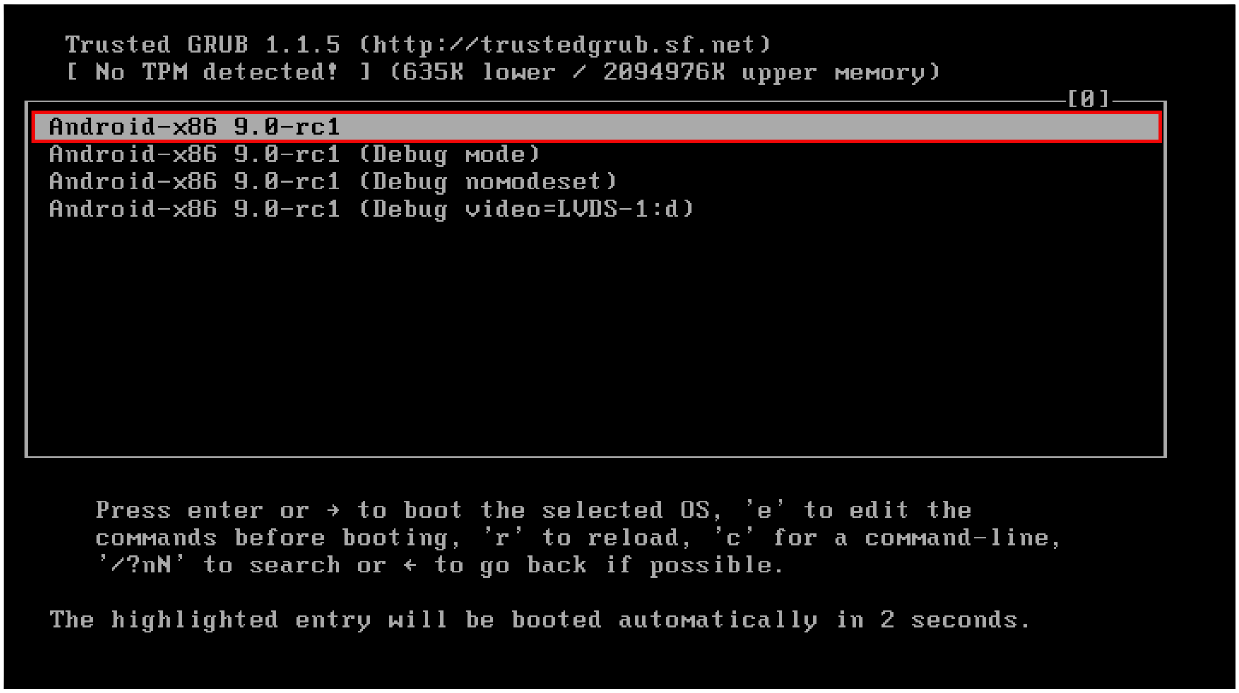
```
v/ram0 androidboot.selinux=permissive SRC=/android-9.0-rc1 nomodeset xforcevesa

 androidboot.selinux=permissive DEBUG=2 SRC=/android-9.0-rc1

=/dev/ram0 androidboot.selinux=permissive DEBUG=2 SRC=/android-9.0-rc1

 root=/dev/ram0 androidboot.selinux=permissive DEBUG=2 SRC=/android-9.0-rc1


:wq
```

38. Type **cd/**and press **Enter**, and then type **reboot -f** and press **Enter** to reboot the machine.



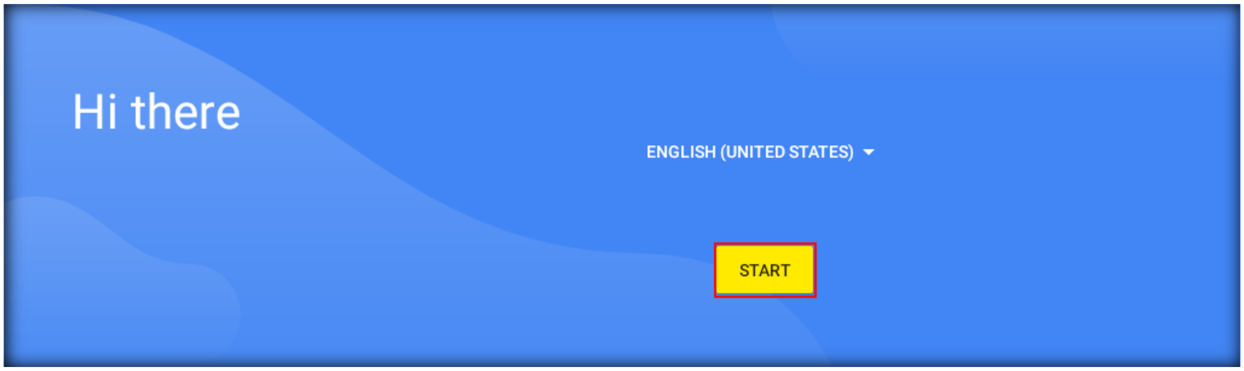
```
v/ram0 androidboot.selinux=permissive SRC=/android-9.0-rc1 nomodeset xforcevesa

 androidboot.selinux=permissive DEBUG=2 SRC=/android-9.0-rc1

=/dev/ram0 androidboot.selinux=permissive DEBUG=2 SRC=/android-9.0-rc1

 root=/dev/ram0 androidboot.selinux=permissive DEBUG=2 SRC=/android-9.0-rc1

:/mnt/grub # cd /
:/ # reboot -f
```

39. The **Android booting options** screen appears; leave the default selection and press **Enter**.

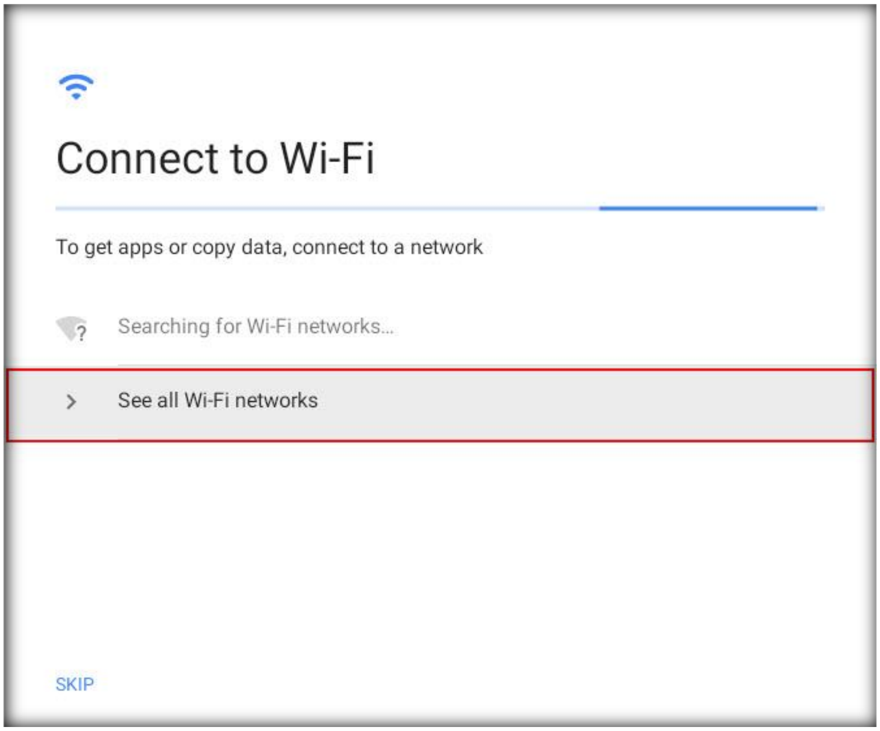


```
   Trusted GRUB 1.1.5 (http://trustedgrub.sf.net)
   [ No TPM detected! ] (635K lower / 2094976K upper memory)

  Android-x86 9.0-rc1
  Android-x86 9.0-rc1 (Debug mode)
  Android-x86 9.0-rc1 (Debug nomodeset)
  Android-x86 9.0-rc1 (Debug video=LVDS-1:d)

     Press enter or → to boot the selected OS, 'e' to edit the
     commands before booting, 'r' to reload, 'c' for a command-line,
     '/?nN' to search or ← to go back if possible.

  The highlighted entry will be booted automatically in 2 seconds.
```

40. The Android virtual machine initializes, displaying a welcome screen; click **START**.


Hi there
ENGLISH (UNITED STATES)
START

41. The **Connect to Wi-Fi** screen appears; click the **See all Wi-Fi networks** option.

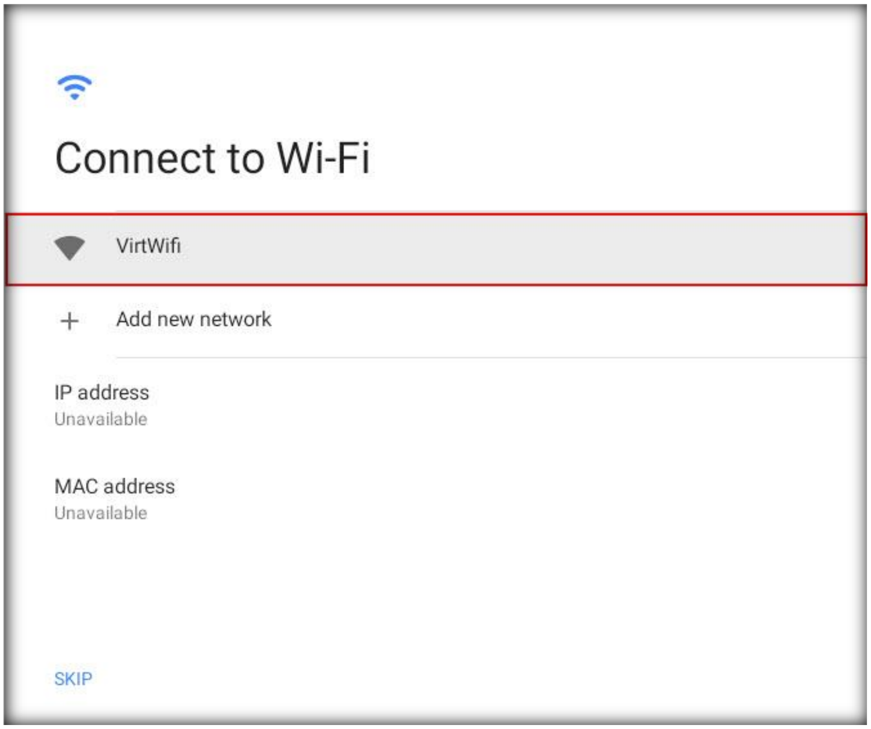

Connect to Wi-Fi
See all Wi-Fi networks
SKIP

To get apps or copy data, connect to a network

Searching for Wi-Fi networks...

42. On the **Connect to Wi-Fi** screen, choose your virtual network interface to connect to the Internet (here, **VirtWifi**).

    **Note**: The network interface may vary in your lab environment.



Connect to Wi-Fi

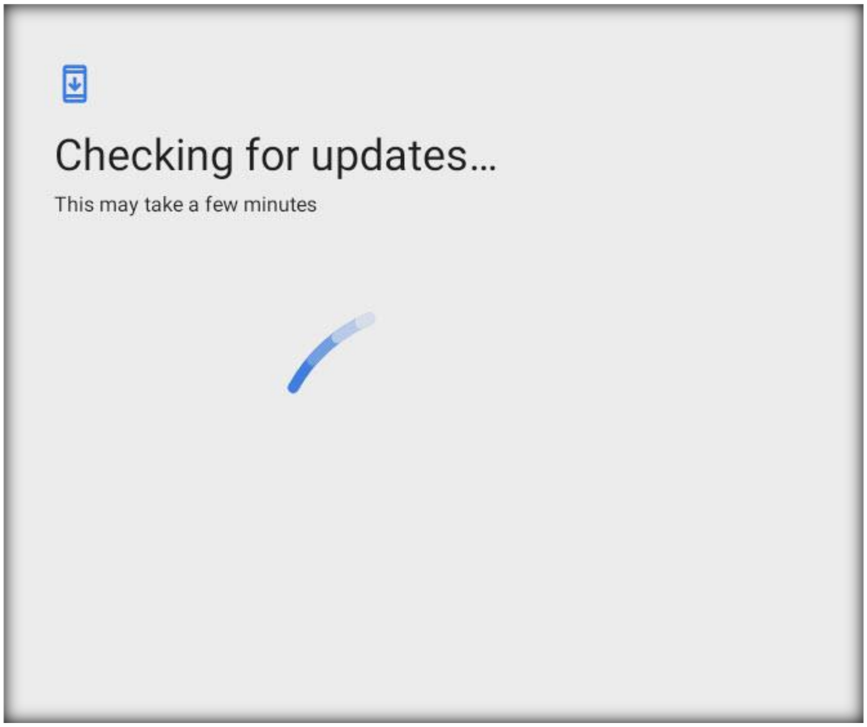
VirtWifi

Add new network

IP address
Unavailable

MAC address
Unavailable

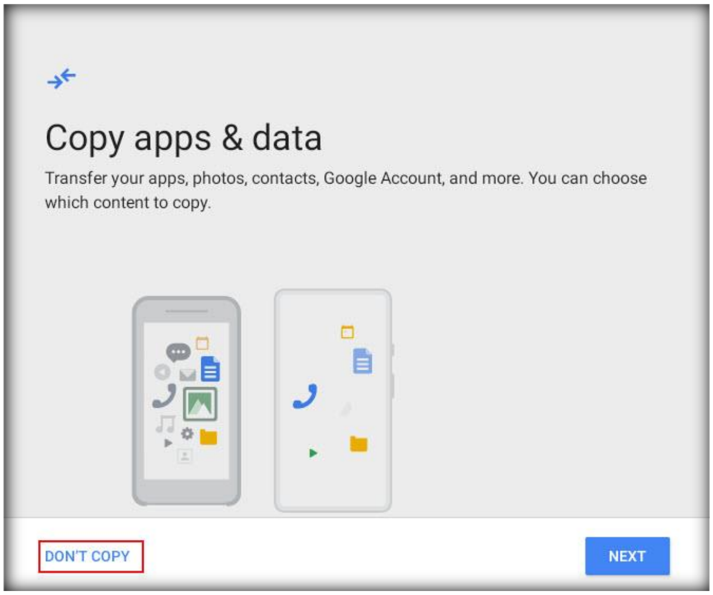
43. The **Checking for updates...** screen appears; wait until it finishes checking for updates.



Checking for updates...

This may take a few minutes

44. On the **Copy apps & data** screen, click **DON'T COPY**.

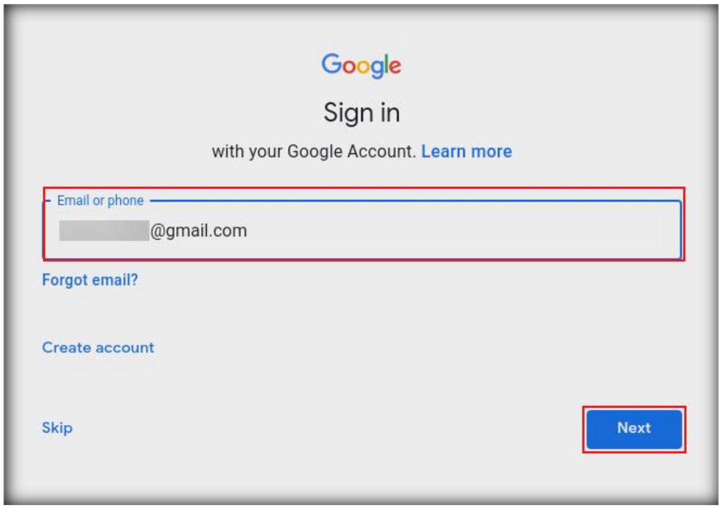


Copy apps & data

Transfer your apps, photos, contacts, Google Account, and more. You can choose which content to copy.

DON'T COPY
NEXT

45. On the **Google Sign in** screen, provide your personal Google account in the **Email or phone** field and click **Next**.



Google

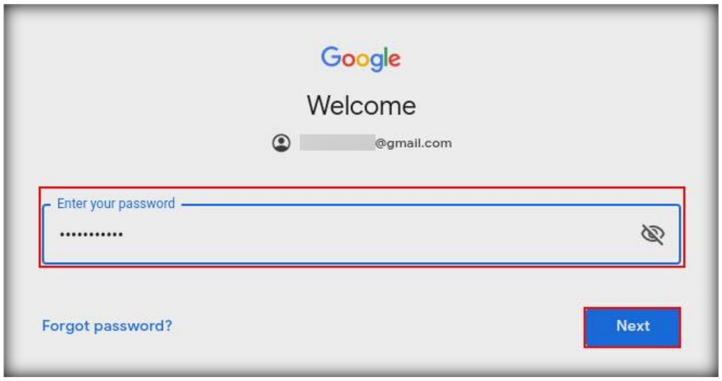
Sign in

with your Google Account. Learn more

Email or phone: [redacted]@gmail.com

Forgot email?
Create account
Skip
Next

46. Type the password for your provided Google account in the **Enter your password** field and click **Next**.



Google

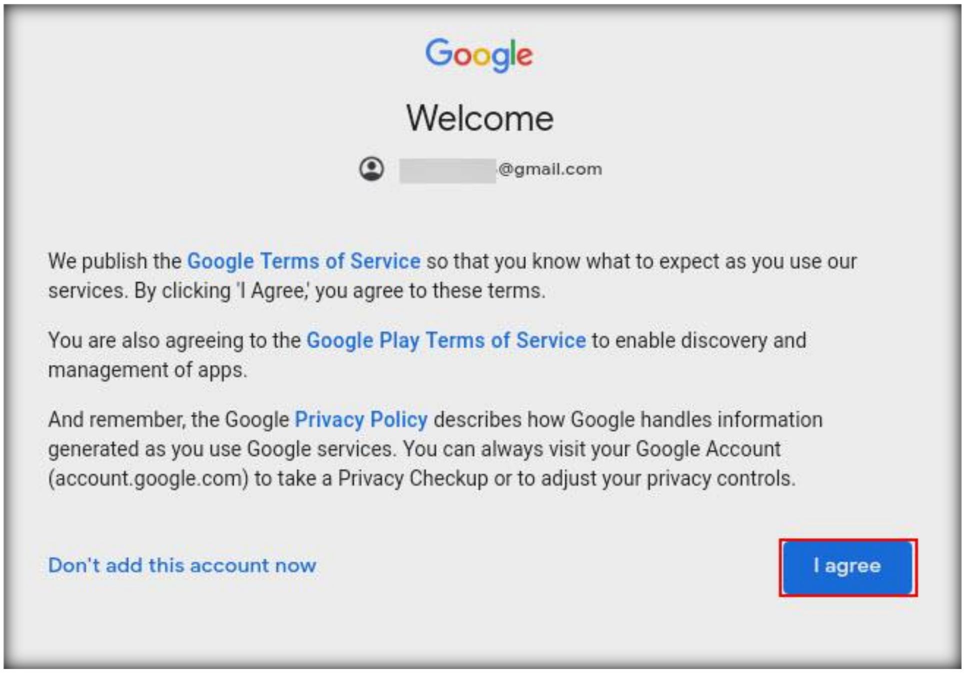
Welcome

[redacted]@gmail.com

Enter your password: •••••••••••

Forgot password?
Next

47. Click **I agree** on the **Google Welcome** page.



Google

Welcome

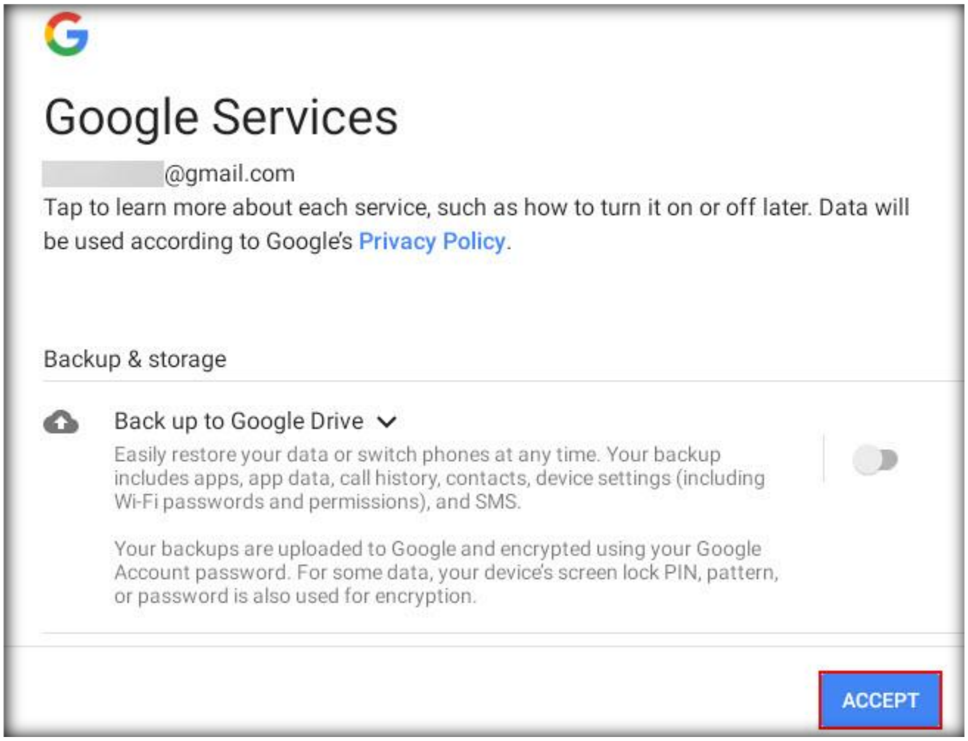
[redacted]@gmail.com

We publish the Google Terms of Service so that you know what to expect as you use our services. By clicking 'I Agree,' you agree to these terms.

You are also agreeing to the Google Play Terms of Service to enable discovery and management of apps.

And remember, the Google Privacy Policy describes how Google handles information generated as you use Google services. You can always visit your Google Account (account.google.com) to take a Privacy Checkup or to adjust your privacy controls.

48. On the **Google Services** screen, turn off all the settings by toggling the button, and then scroll down and click **ACCEPT**.



Google Services

[redacted]@gmail.com

Tap to learn more about each service, such as how to turn it on or off later. Data will be used according to Google's Privacy Policy.

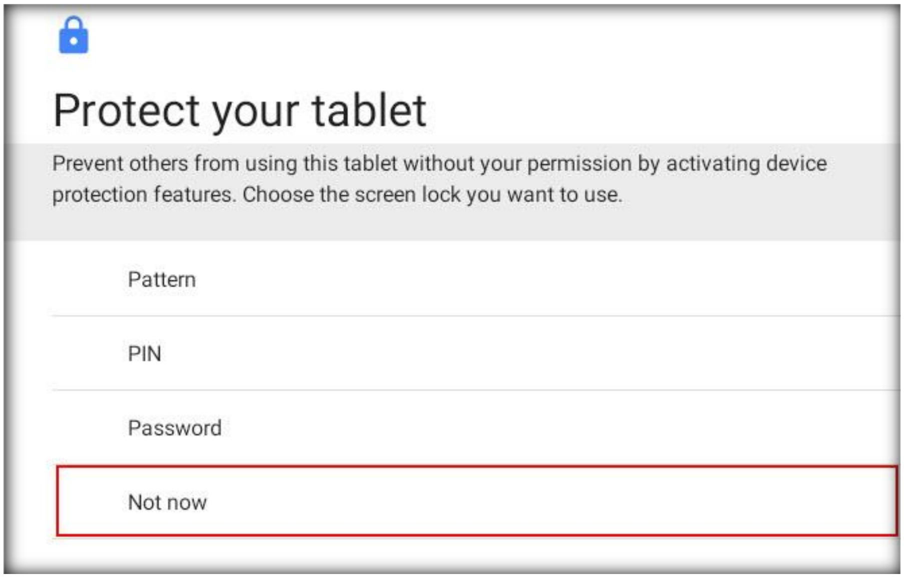
Backup & storage

Back up to Google Drive

Easily restore your data or switch phones at any time. Your backup includes apps, app data, call history, contacts, device settings (including Wi-Fi passwords and permissions), and SMS.

Your backups are uploaded to Google and encrypted using your Google Account password. For some data, your device's screen lock PIN, pattern, or password is also used for encryption.

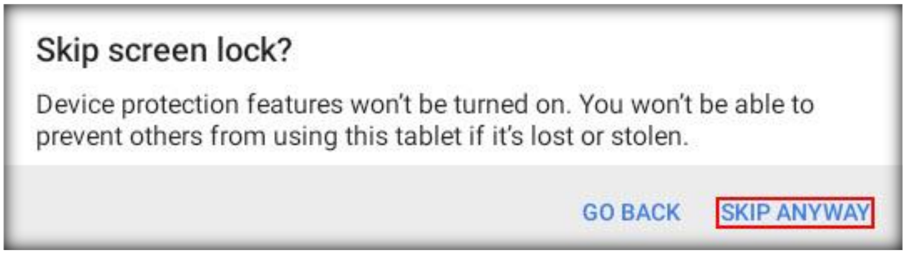
49. The **Protect your tablet** screen appears; click **Not now**.



Protect your tablet

Prevent others from using this tablet without your permission by activating device protection features. Choose the screen lock you want to use.

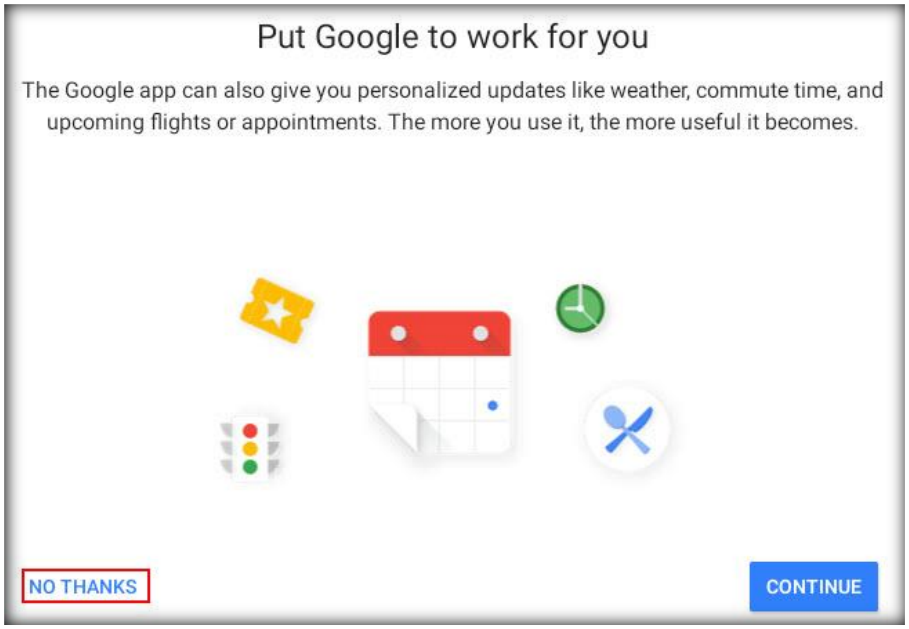
50. The **Skip screen lock** pop-up appears; click **SKIP ANYWAY**.



Skip screen lock?

Device protection features won't be turned on. You won't be able to prevent others from using this tablet if it's lost or stolen.

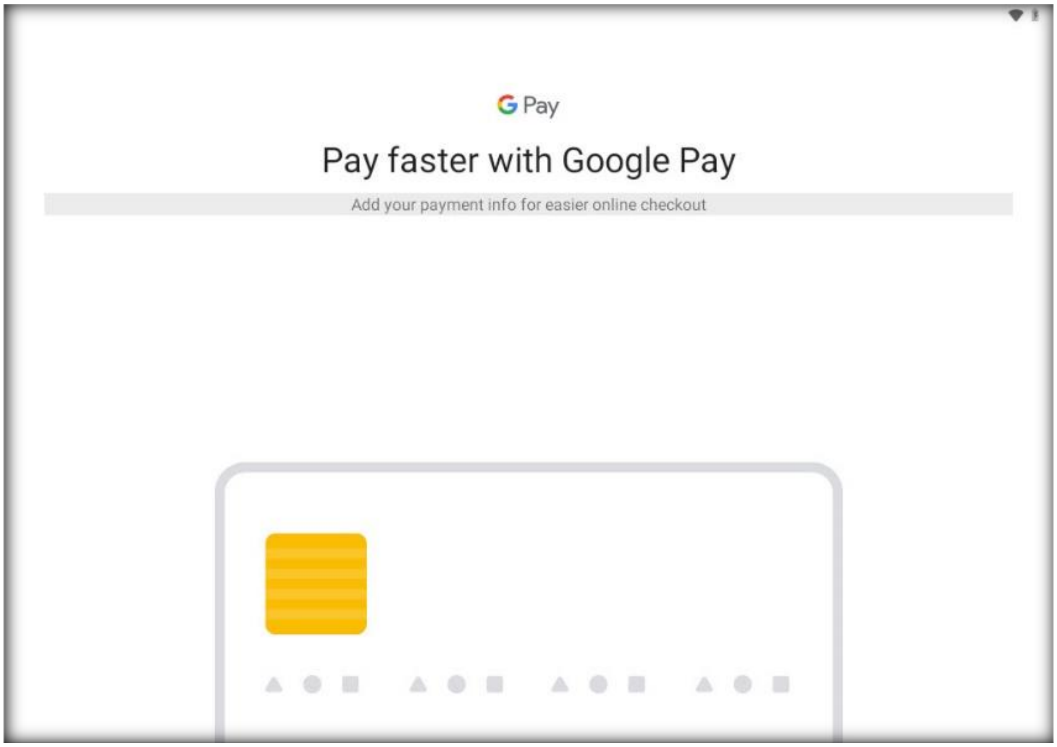
51. The **Put Google to work for you** screen appears; click **NO THANKS**.

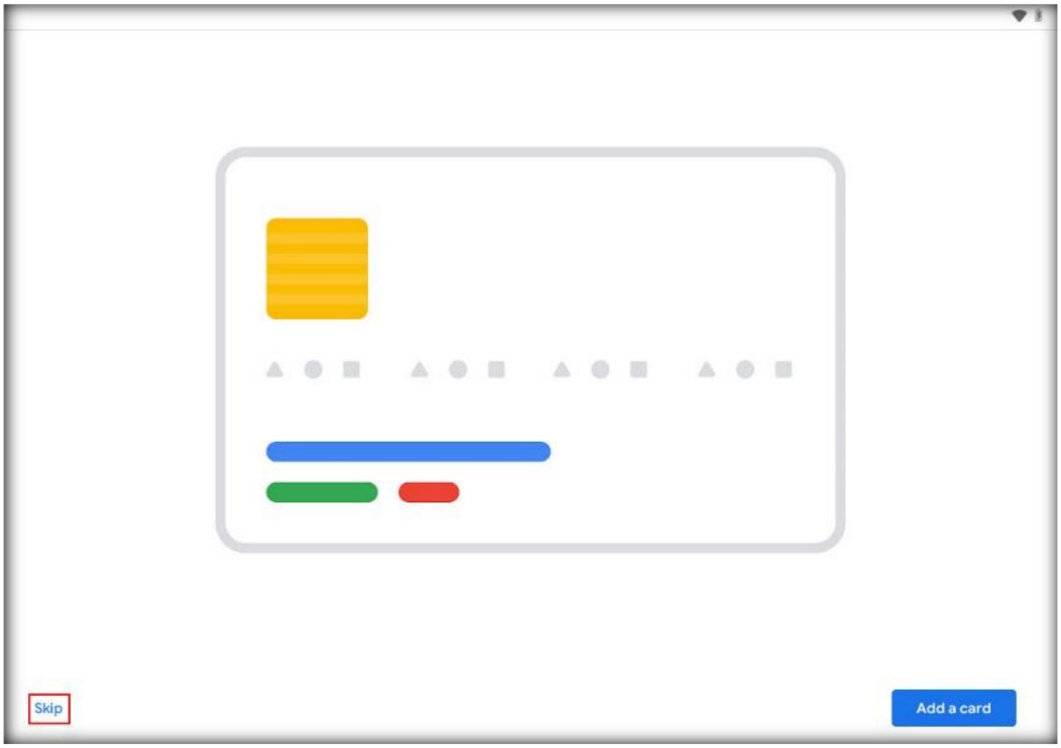


Put Google to work for you

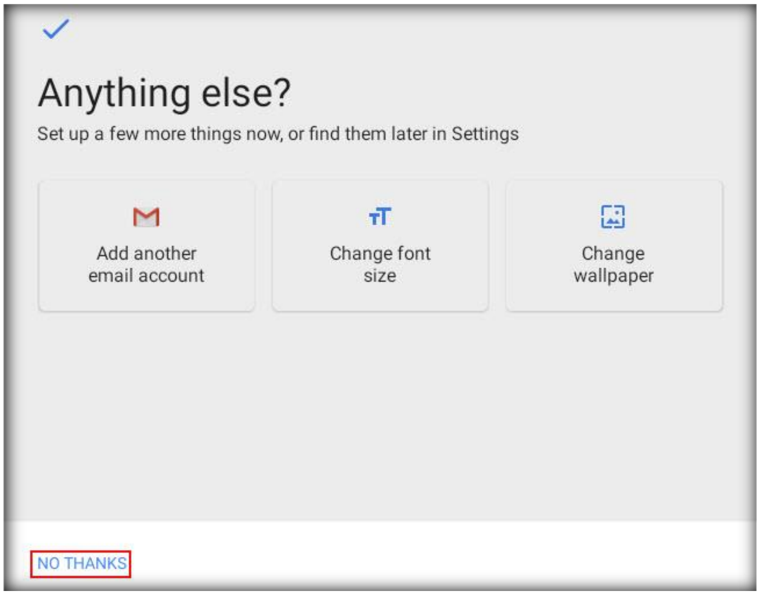
The Google app can also give you personalized updates like weather, commute time, and upcoming flights or appointments. The more you use it, the more useful it becomes.

52. If the **Pay faster with Google Pay** screen appears, scroll down and click **Skip**.


G Pay
Pay faster with Google Pay
Add your payment info for easier online checkout


Skip
Add a card

53. On the **Anything else?** screen, click **NO THANKS**.

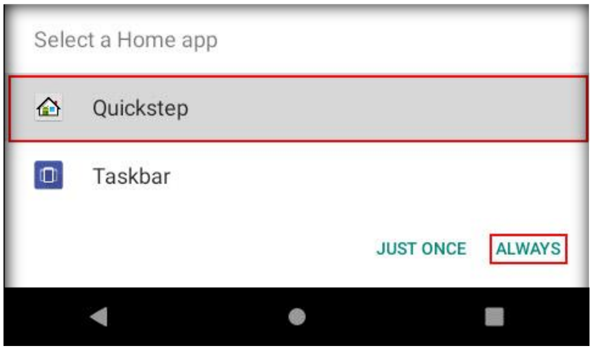


Anything else?

Set up a few more things now, or find them later in Settings

Add another email account
Change font size
Change wallpaper
NO THANKS

54. The **Select a Home app** pop-up appears; click **Quickstep** and click **ALWAYS**, as shown in the screenshot.

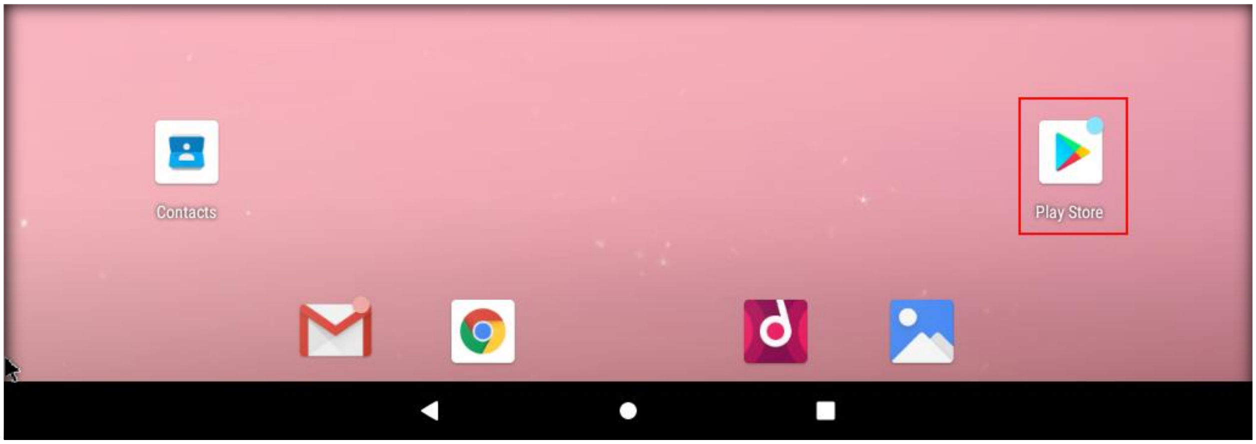


Select a Home app

Quickstep
Taskbar
JUST ONCE
ALWAYS

55. You have successfully installed the Android machine, as the screenshot shows. Click the **Play Store** icon from the Home Screen.

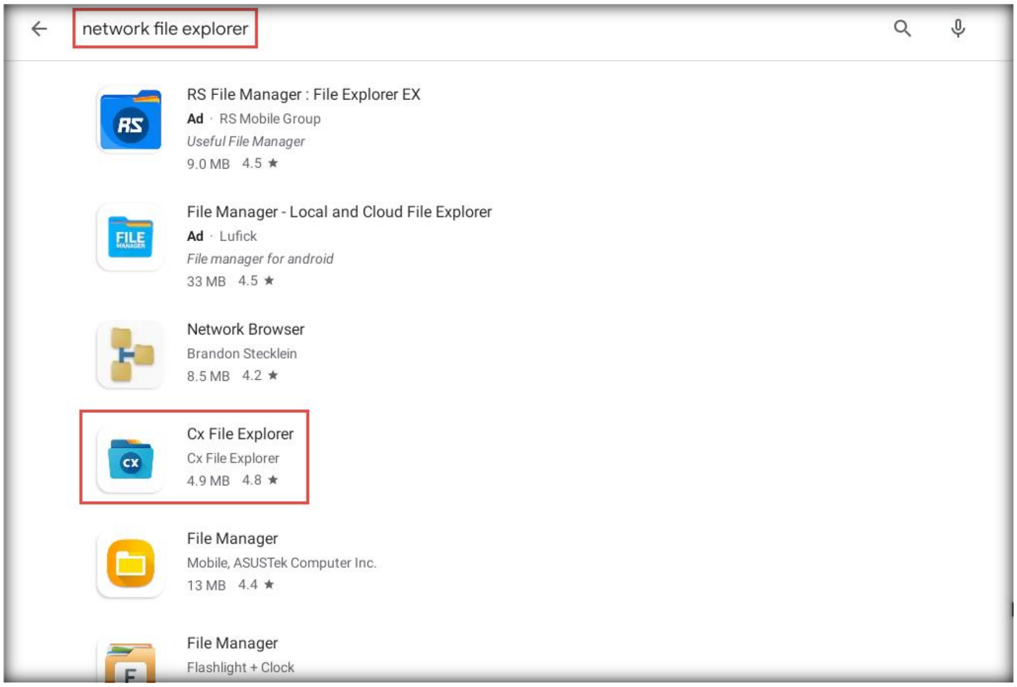
**Note**: If the **Play Store** icon is not available on the **Home Screen**, scroll upward to view the apps menu and click **Play Store**.



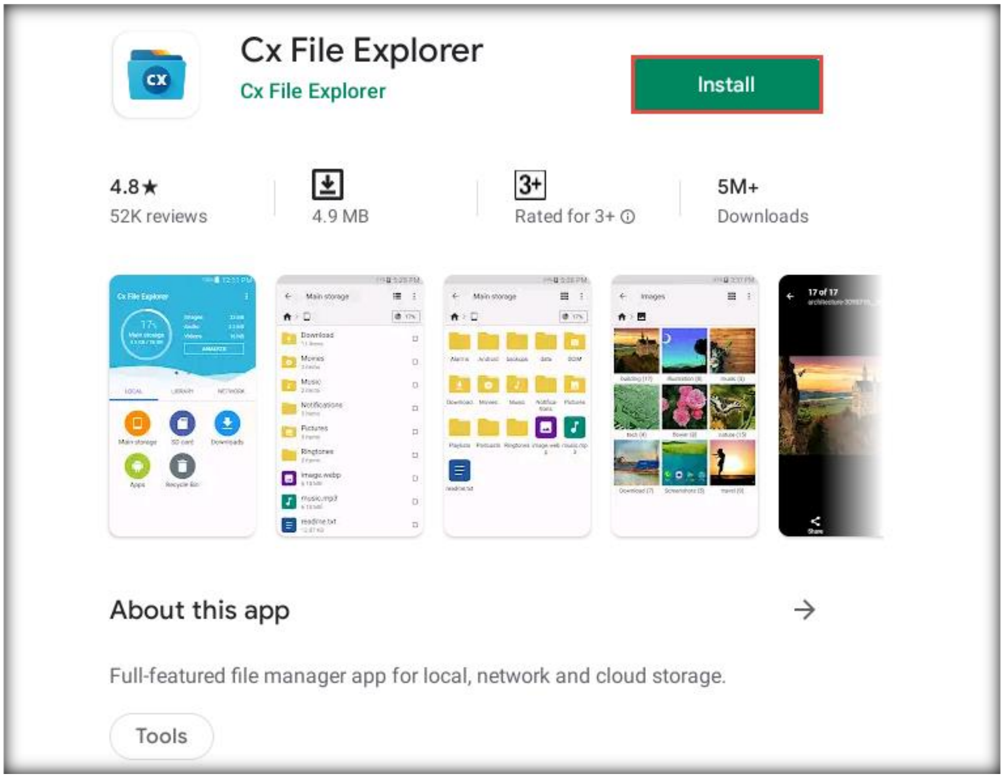
Contacts
Play Store

56. Type **network file explorer** in the **Play Store** search bar and press **Enter**. From the search results, click **Cx File Explorer**.

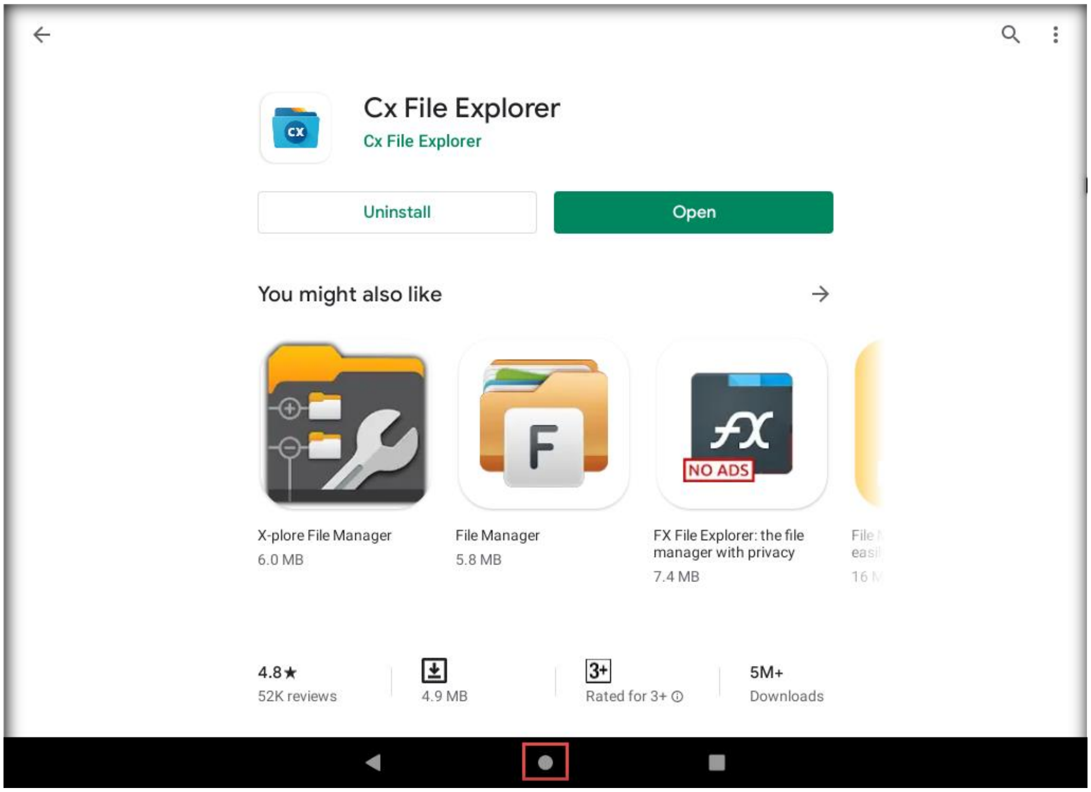
    **Note**: You may install any other application for network file sharing to access **CEH-Tools** from the **Windows 10** virtual machine.


network file explorer
RS File Manager : File Explorer EX
Ad · RS Mobile Group
Useful File Manager
9.0 MB 4.5 ★
File Manager - Local and Cloud File Explorer
Ad · Lufick
File manager for android
33 MB 4.5 ★
Network Browser
Brandon Stecklein
8.5 MB 4.2 ★
Cx File Explorer
Cx File Explorer
4.9 MB 4.8 ★
File Manager
Mobile, ASUSTek Computer Inc.
13 MB 4.4 ★
File Manager
Flashlight + Clock

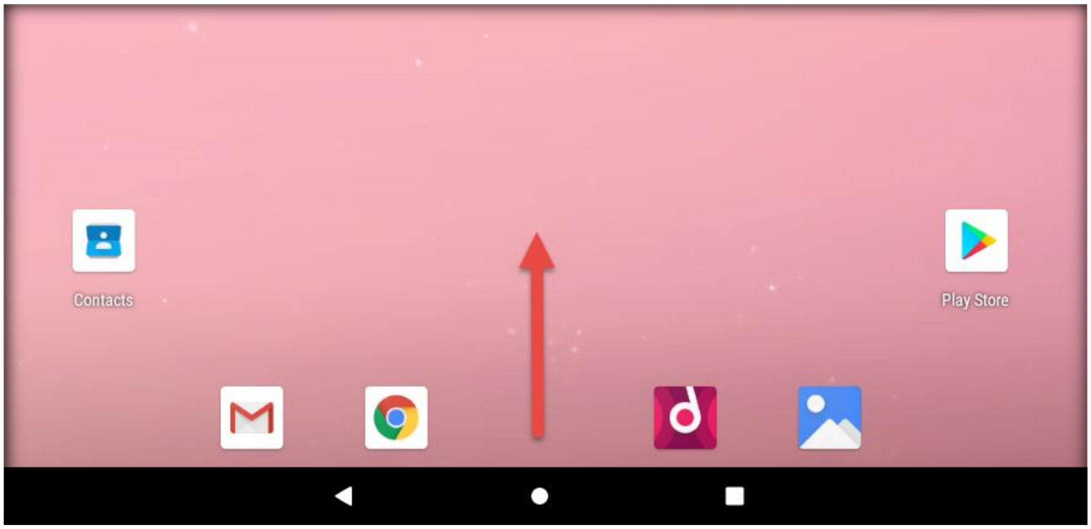
57. Click the **Install** button to begin installing the application.


Cx File Explorer
Cx File Explorer
Install
4.8★
52K reviews
4.9 MB
Rated for 3+
5M+
Downloads
About this app
Full-featured file manager app for local, network and cloud storage.
Tools

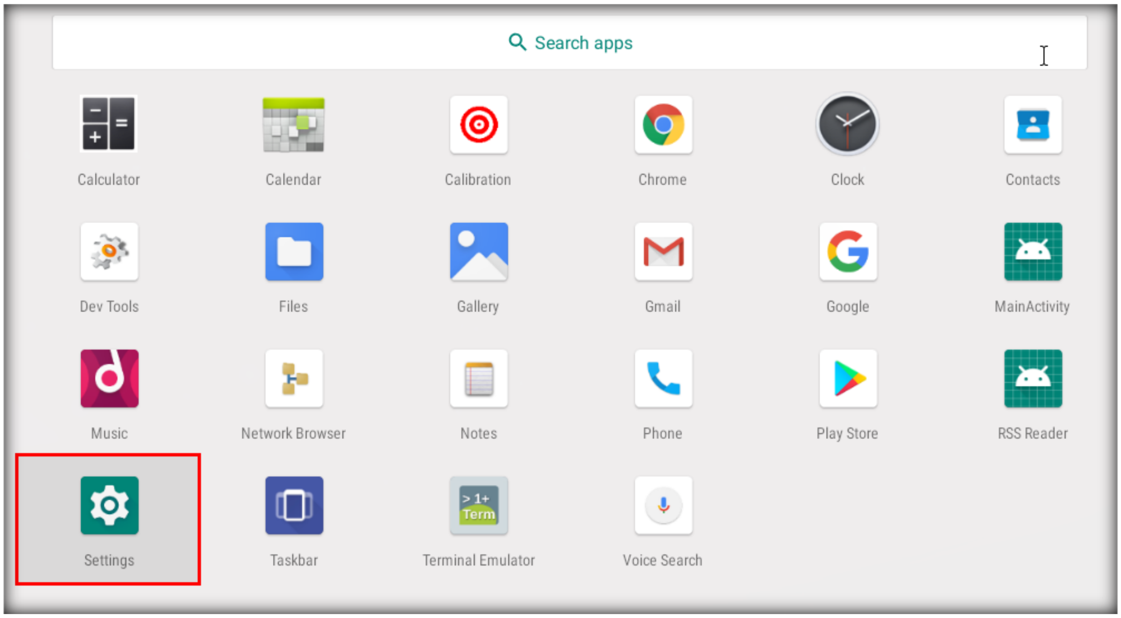
58. Wait for the application to install. On completing the installation, close all open applications by clicking on the **Home** button.


Cx File Explorer
Cx File Explorer
Uninstall
Open
You might also like
X-plore File Manager
6.0 MB
File Manager
5.8 MB
NO ADS
FX File Explorer: the file manager with privacy
7.4 MB
4.8★
52K reviews
4.9 MB
Rated for 3+
5M+
Downloads

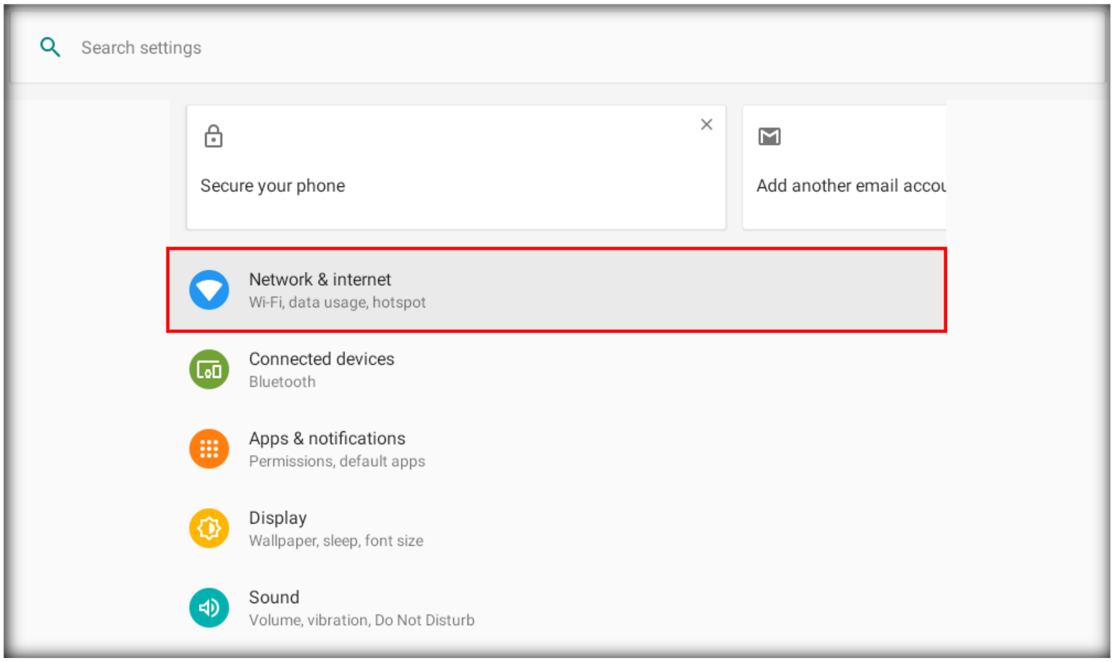
59. Now, in the Home Screen, click on the lower section of the window and slide up to open the icon tray.


Contacts
Play Store

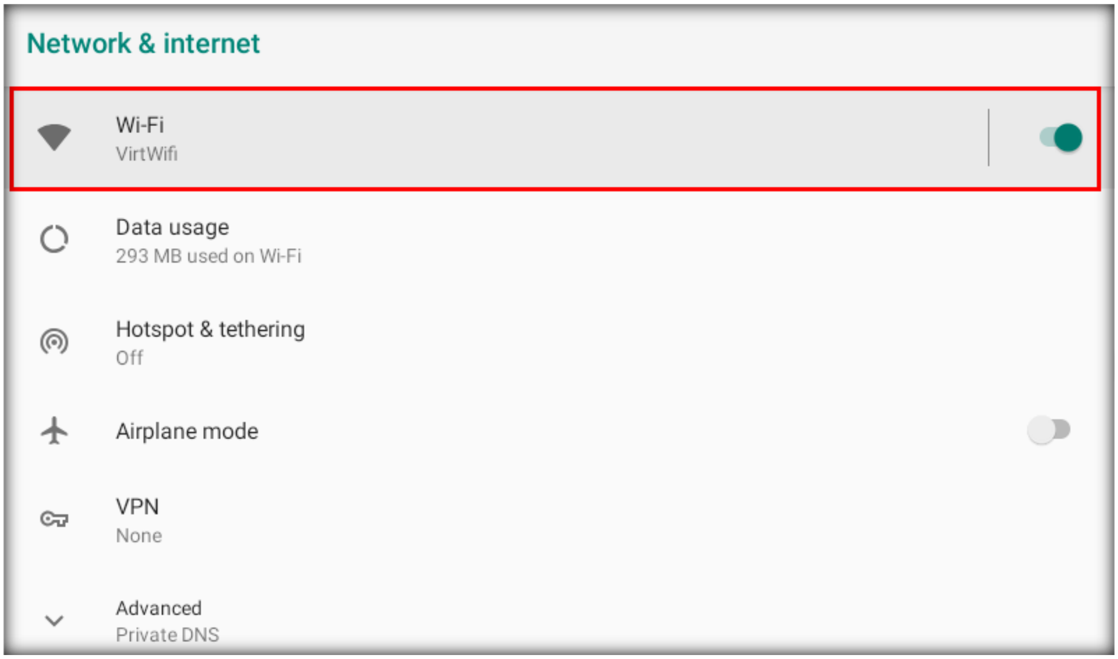
60. Now, from the available applications, click the **Settings** icon.


Search apps
Calculator
Calendar
Calibration
Chrome
Clock
Contacts
Dev Tools
Files
Gallery
Gmail
Google
MainActivity
Music
Network Browser
Notes
Phone
Play Store
RSS Reader
Settings
Taskbar
Terminal Emulator
Voice Search

61. Under the settings options, click the **Network & Internet** option.


Search settings
Secure your phone
Add another email accou
Network & internet
Wi-Fi, data usage, hotspot
Connected devices
Bluetooth
Apps & notifications
Permissions, default apps
Display
Wallpaper, sleep, font size
Sound
Volume, vibration, Do Not Disturb

62. The **Network & internet** settings appear; click on the connected **Wi-Fi** (here, **VirtWifi**).



Network & internet

Wi-Fi
VirtWifi

Data usage
293 MB used on Wi-Fi

Hotspot & tethering
Off

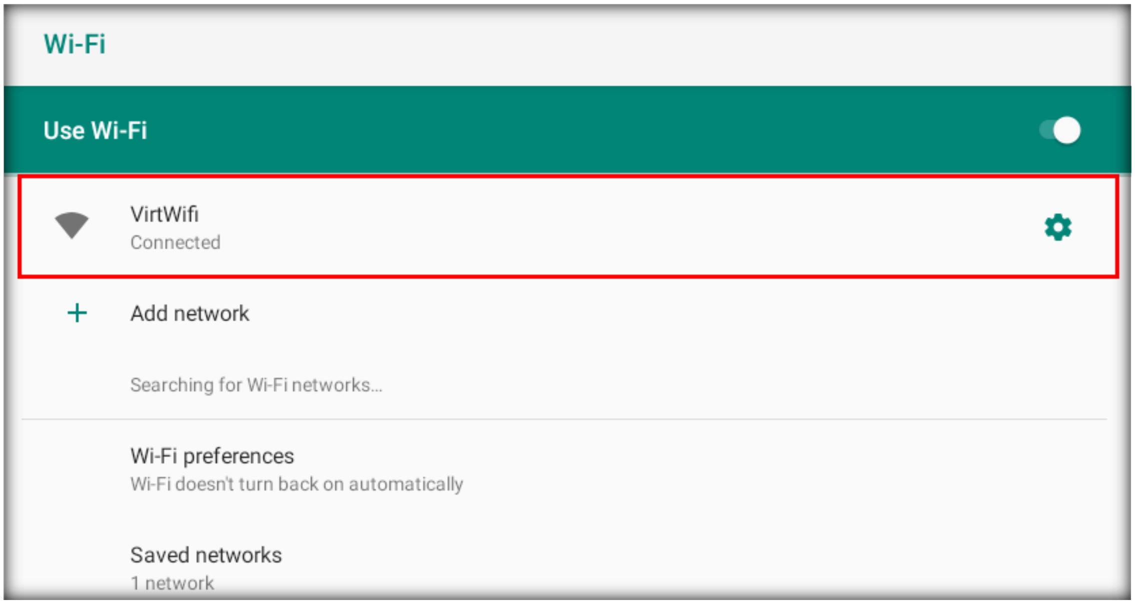
Airplane mode

VPN
None

Advanced
Private DNS

63. The **Wi-Fi** settings appear. Click on the connected Wi-Fi access point name (here, **VirtWifi**) to open the network settings.

**Note**: The name of the access point might differ in your lab environment.



Wi-Fi

Use Wi-Fi

VirtWifi
Connected

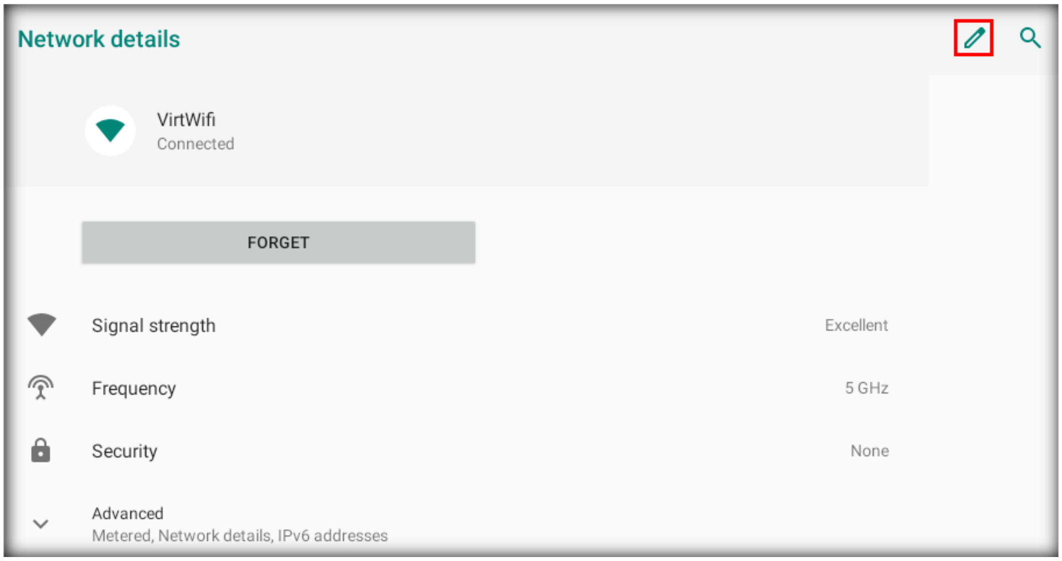
Add network

Searching for Wi-Fi networks...

Wi-Fi preferences
Wi-Fi doesn't turn back on automatically

Saved networks
1 network

64. The **Network details** windows appears; click the **Modify** icon (✎) from the right-hand pane.

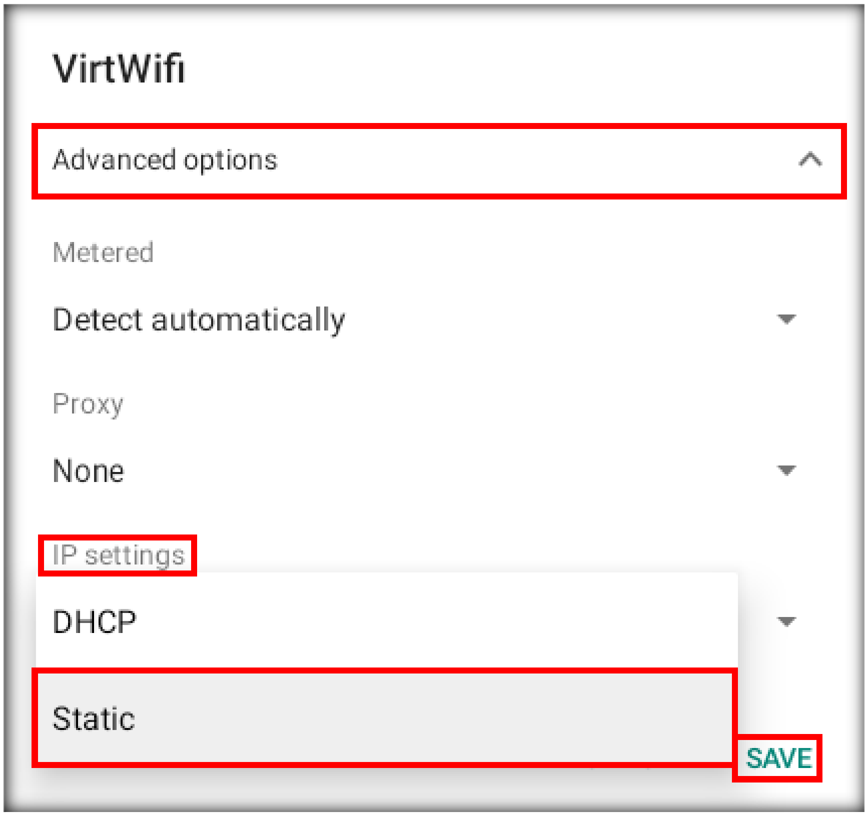


Network details

VirtWifi
Connected

Signal strength: Excellent
Frequency: 5 GHz
Security: None
Advanced
Metered, Network details, IPv6 addresses

65. The **VirtWifi** pop-up appears; expand **Advanced options** and select **Static** from the drop-down list under the **IP settings** option. Click **SAVE** to save these changes.

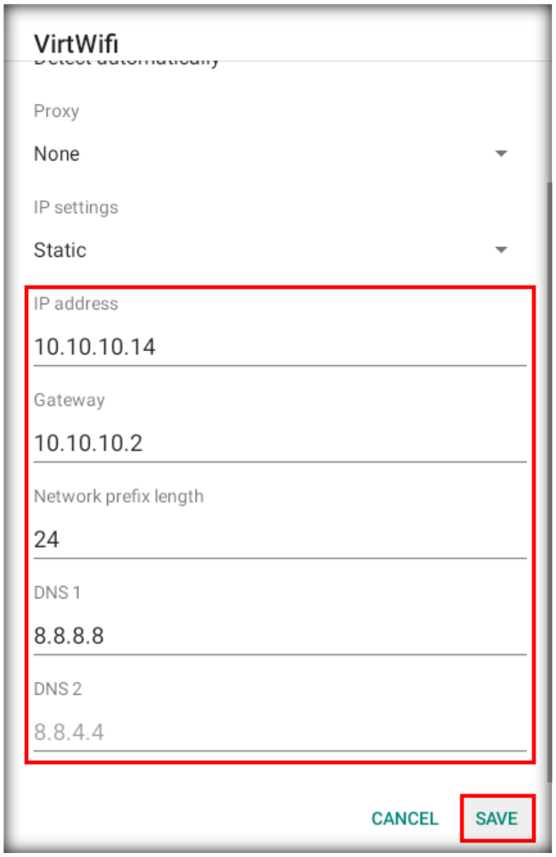


VirtWifi

Advanced options

Metered: Detect automatically
Proxy: None
IP settings

66. In the **IP address** field, enter **10.10.10.14**, and in the **Gateway** field, type **10.10.10.2**. Leave the default **Network prefix length**, **DNS 1**, and **DNS 2** values and click **SAVE**.



VirtWifi

Proxy: None

IP settings: Static

IP address: 10.10.10.14

Gateway: 10.10.10.2

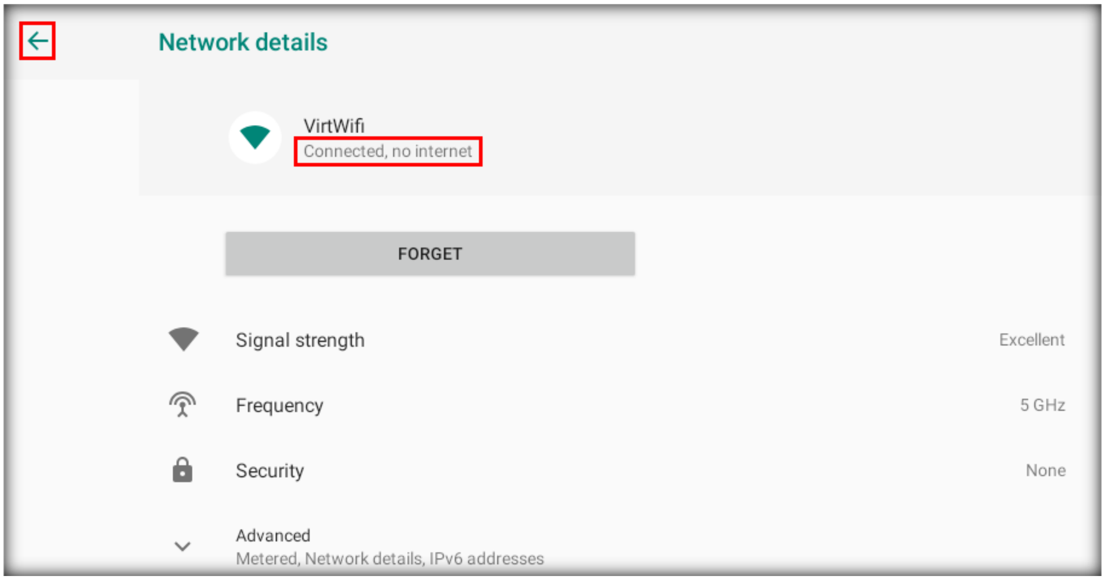
Network prefix length: 24

DNS 1: 8.8.8.8

DNS 2: 8.8.4.4

67. The **Network details** page appears. Observe that **Connected, no internet** is displayed under the **VirtWifi** access point, as shown in the screenshot.

68. Click the back arrow icon (←) from the left-hand pane to navigate back to the **Wi-Fi** settings page.



Network details

VirtWifi
Connected, no internet

Signal strength: Excellent

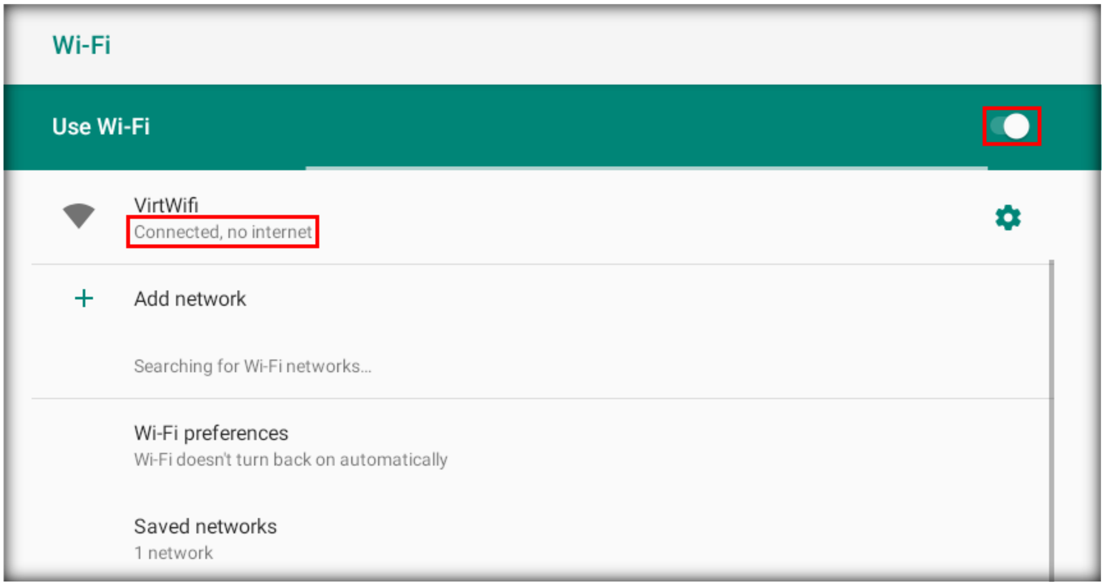
Frequency: 5 GHz

Security: None

Advanced
Metered, Network details, IPv6 addresses

69. The **Wi-Fi** settings page appears. Observe that **Connected**, **no internet** is displayed under the **VirtWifi** access point, as shown in the screenshot.

70. The **Wi-Fi** settings page appears; under the **Use Wi-Fi** option, click the button (●) to toggle it off.


Wi-Fi
Use Wi-Fi
VirtWifi
Add network
Wi-Fi preferences
Saved networks

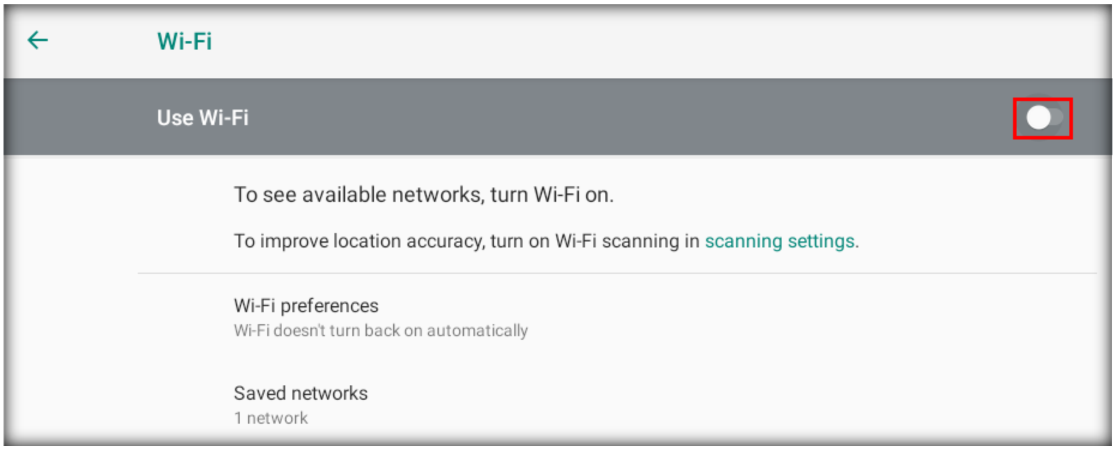
Connected, no internet

Searching for Wi-Fi networks...

Wi-Fi doesn't turn back on automatically

1 network

71. Observe that the Wi-Fi is turned off. Now, click the button (●) to turn the Wi-Fi on again.


Wi-Fi
Use Wi-Fi
Wi-Fi preferences
Saved networks

To see available networks, turn Wi-Fi on.

To improve location accuracy, turn on Wi-Fi scanning in scanning settings.

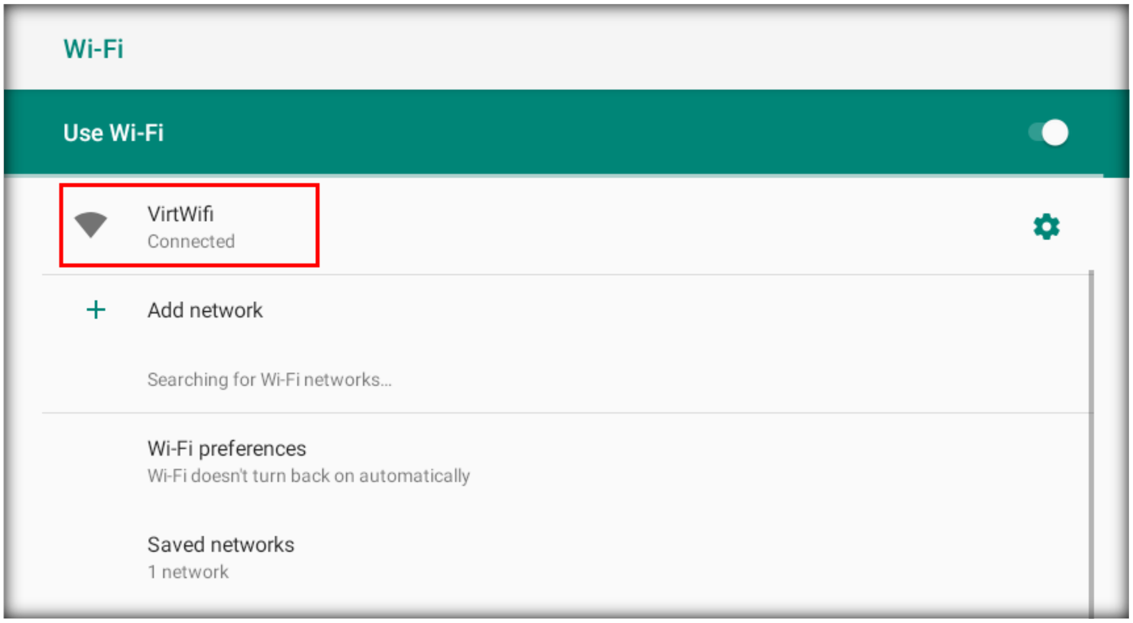
Wi-Fi doesn't turn back on automatically

1 network

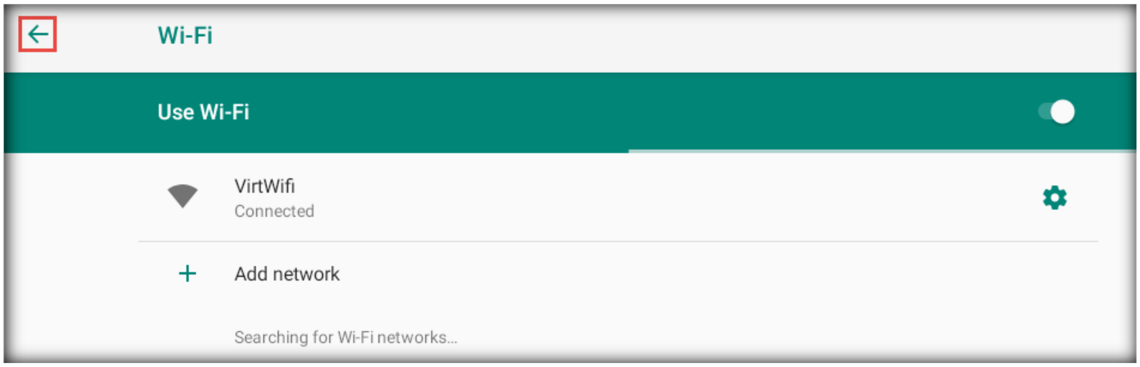
72. The system scans for available Wi-Fi access points and displays the **VirtWifi** access point. Click on it to connect to it.

**Note**: The name of the access point might differ in your lab environment.

73. Observe that the status under the **VirtWifi** access point has changed to **Connected**, as shown in the screenshot.

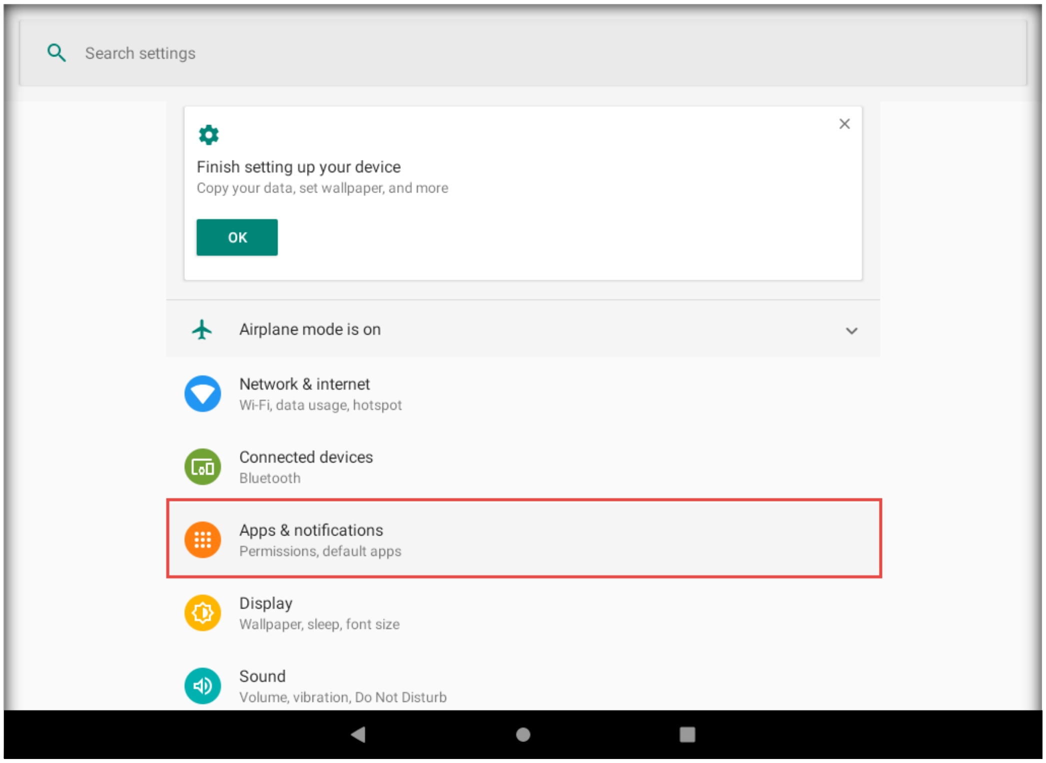

Wi-Fi
Use Wi-Fi
VirtWifi
Connected
Add network
Searching for Wi-Fi networks...
Wi-Fi preferences
Wi-Fi doesn't turn back on automatically
Saved networks
1 network

74. Click the back arrow icon (←) from the left-hand pane to navigate back to the **Network & internet** settings page.

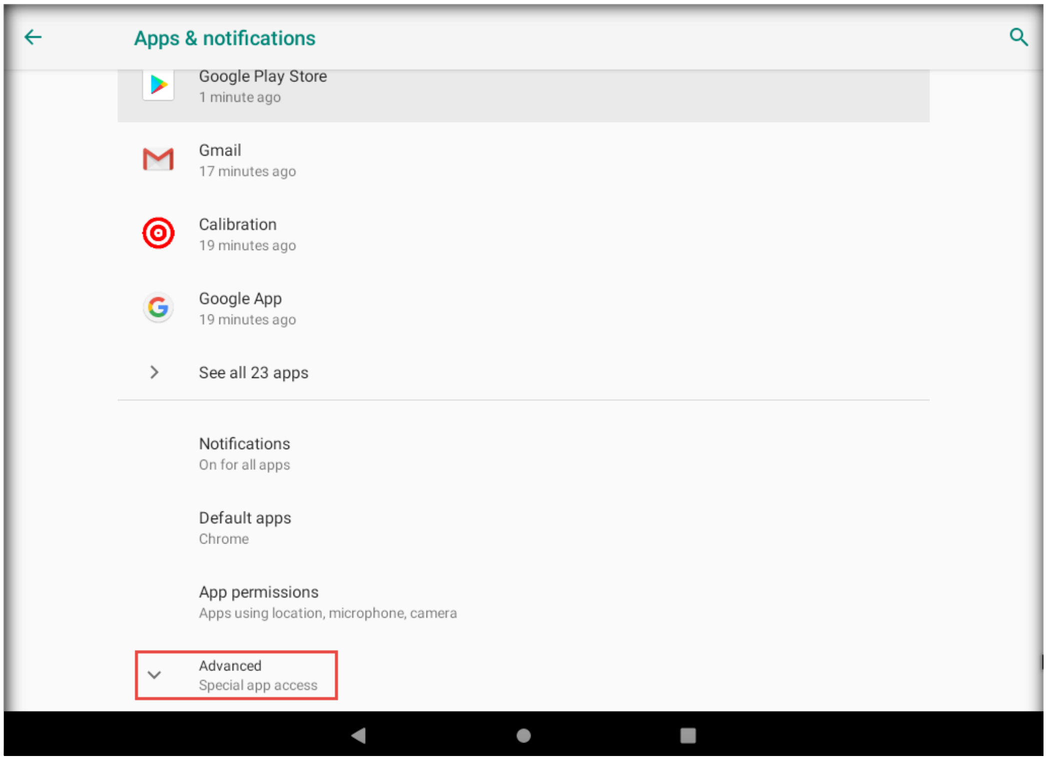

Wi-Fi
Use Wi-Fi
VirtWifi
Connected
Add network
Searching for Wi-Fi networks...

75. On the **Network & internet** settings page, click the back arrow icon (←) again to navigate back to the main **Settings** page.

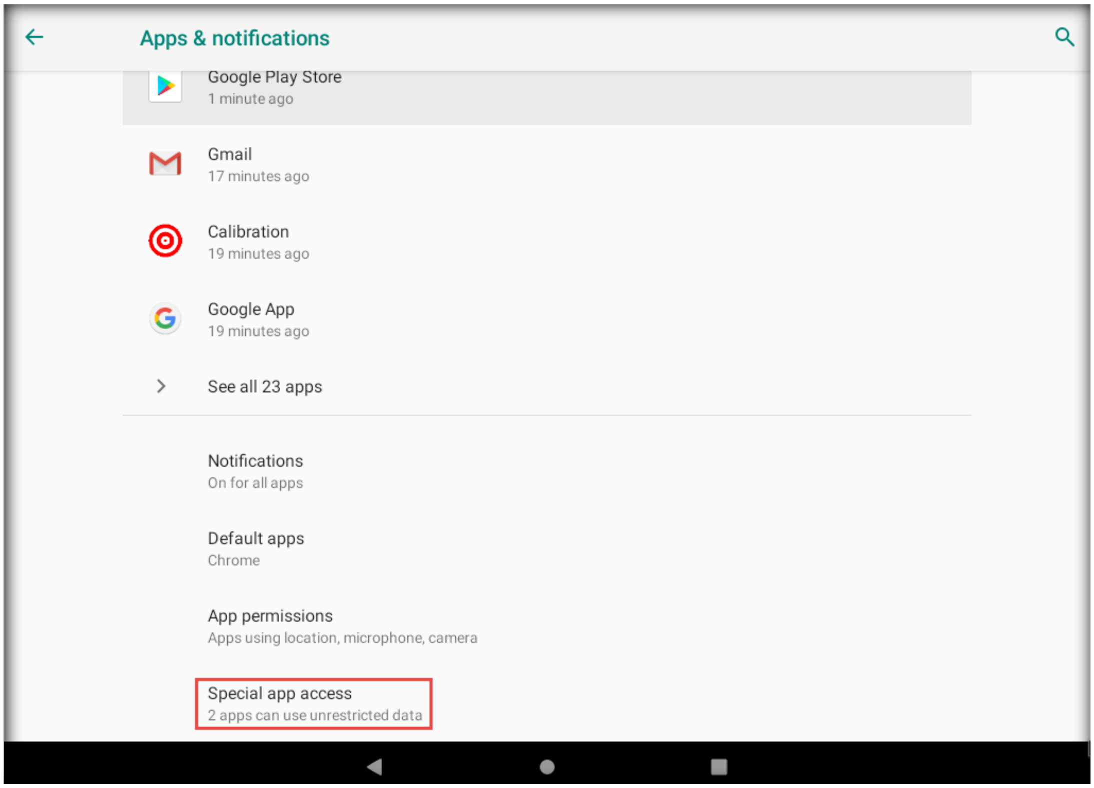
76. On the **Settings** page, click the **Apps & notifications** option


Search settings
Finish setting up your device
Copy your data, set wallpaper, and more
OK
Airplane mode is on
Network & internet
Wi-Fi, data usage, hotspot
Connected devices
Bluetooth
Apps & notifications
Permissions, default apps
Display
Wallpaper, sleep, font size
Sound
Volume, vibration, Do Not Disturb

77. The **Apps & notifications** page appears; scroll-down and click to expand the **Advanced** option.

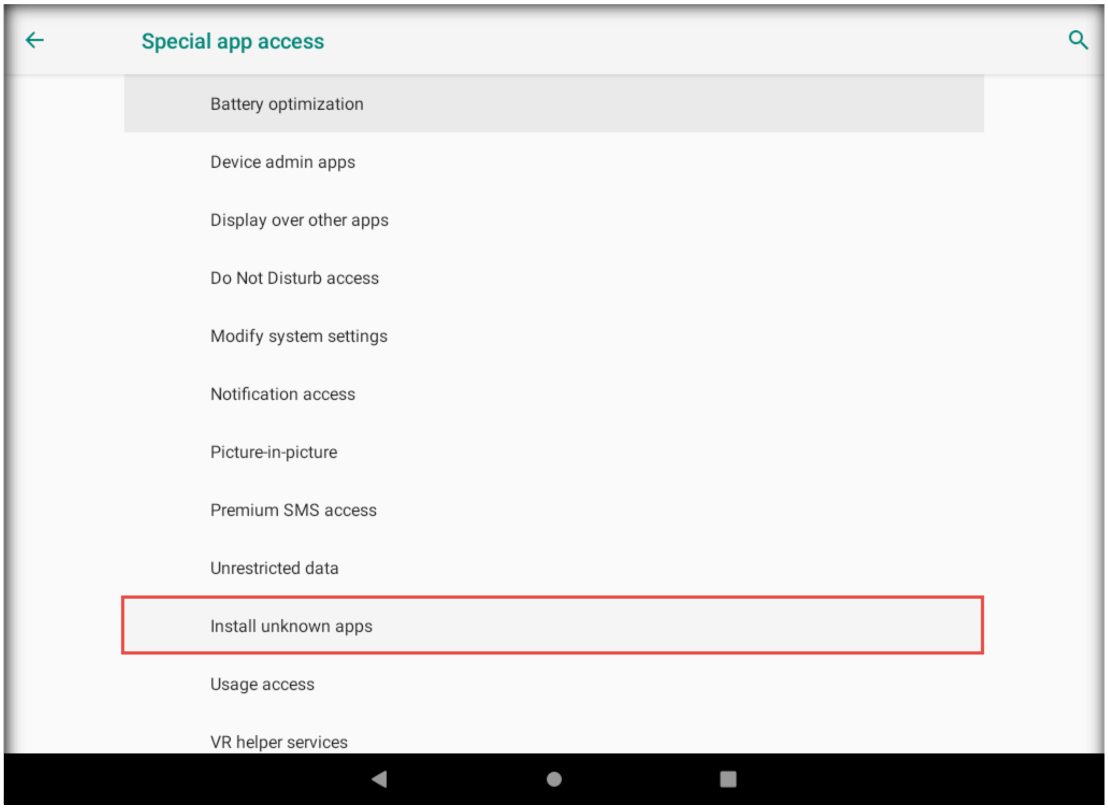

Apps & notifications
Google Play Store
1 minute ago
Gmail
17 minutes ago
Calibration
19 minutes ago
Google App
19 minutes ago
See all 23 apps
Notifications
On for all apps
Default apps
Chrome
App permissions
Apps using location, microphone, camera
Advanced
Special app access

78. Under the **Advanced** option, click the **Special app access** option.



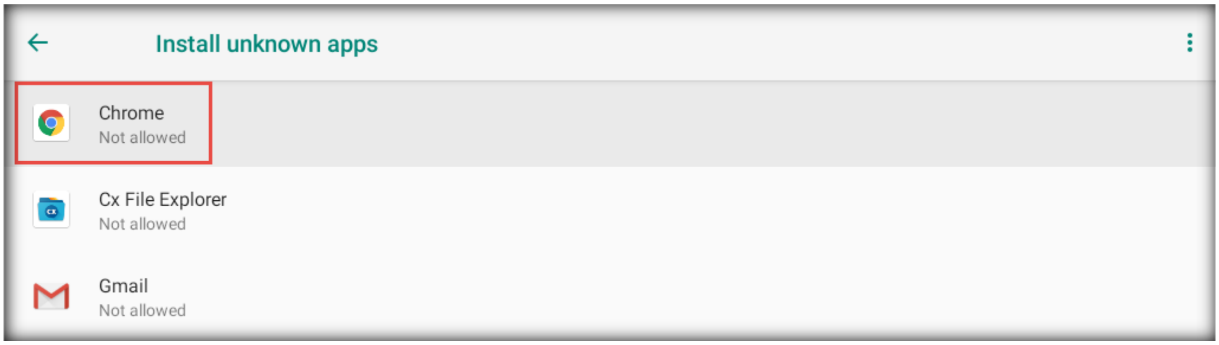
Apps & notifications
Google Play Store
1 minute ago
Gmail
17 minutes ago
Calibration
19 minutes ago
Google App
19 minutes ago
See all 23 apps
Notifications
On for all apps
Default apps
Chrome
App permissions
Apps using location, microphone, camera
Special app access
2 apps can use unrestricted data

79. On the **Special app access** page, click the **Install unknown apps** option.



Special app access
Battery optimization
Device admin apps
Display over other apps
Do Not Disturb access
Modify system settings
Notification access
Picture-in-picture
Premium SMS access
Unrestricted data
Install unknown apps
Usage access
VR helper services

80. The **Install unknown apps** page appears; click the **Chrome** app.



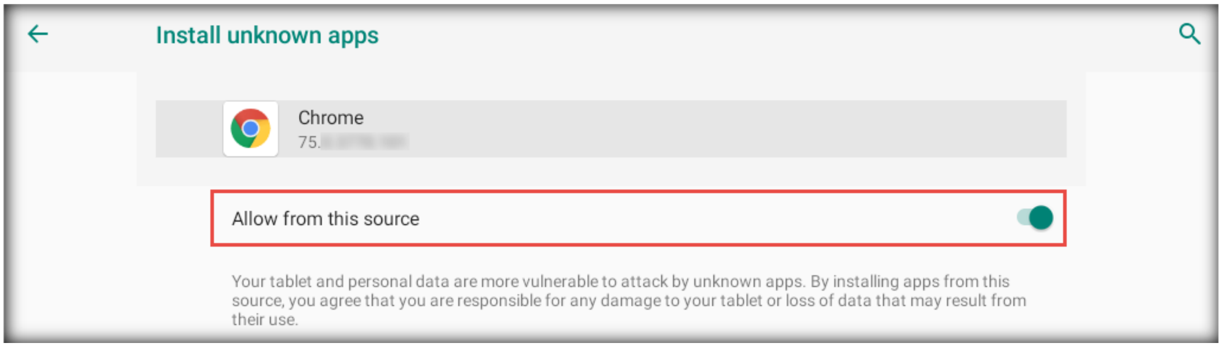
Install unknown apps

Chrome
Not allowed

Cx File Explorer
Not allowed

Gmail
Not allowed

81. The **Chrome** app permission setting appears; click the **Allow from this source** option to enable the option.



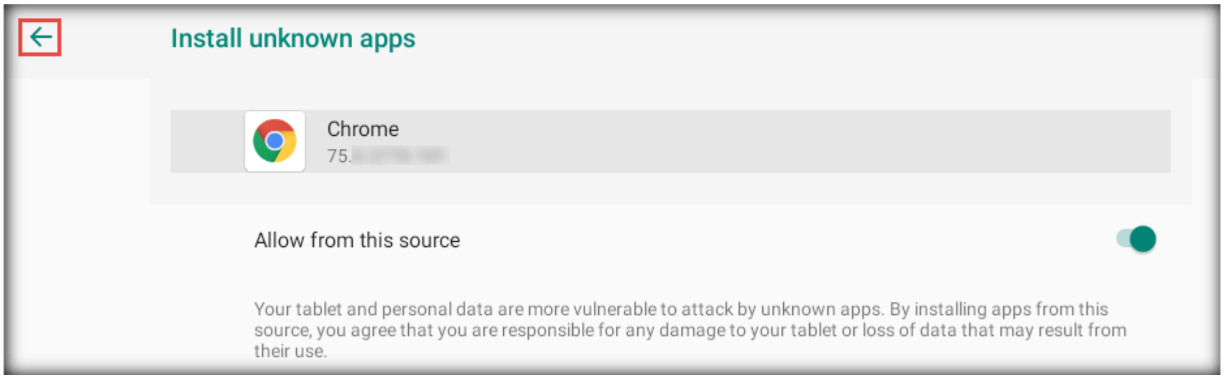
Install unknown apps

Chrome
75.[redacted]

Allow from this source

Your tablet and personal data are more vulnerable to attack by unknown apps. By installing apps from this source, you agree that you are responsible for any damage to your tablet or loss of data that may result from their use.

82. Now, click the back arrow icon (←) from the left-hand pane to navigate back to the **Install unknown apps** main page.



Install unknown apps

Chrome
75.[redacted]

Allow from this source

Your tablet and personal data are more vulnerable to attack by unknown apps. By installing apps from this source, you agree that you are responsible for any damage to your tablet or loss of data that may result from their use.

83. The **Install unknown apps** page appears.

84. Similarly, enable the **Allow from this source** option for the **Cx File Explorer** and **Gmail** applications.

85. Close all applications and turn off the virtual machine.

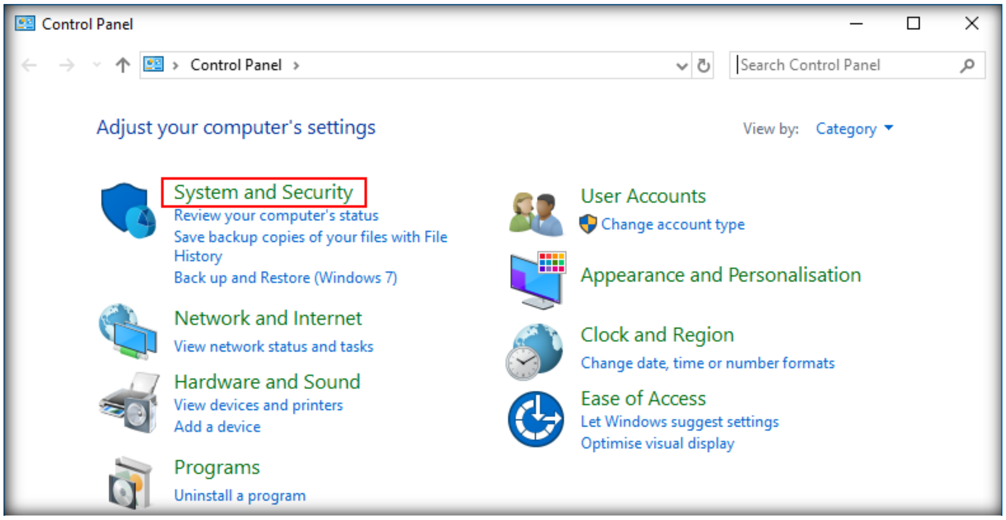
[Back to Configuration Task Outline]

# CT#13: Turn the Windows Defender Firewall Off on all Windows Virtual Machines

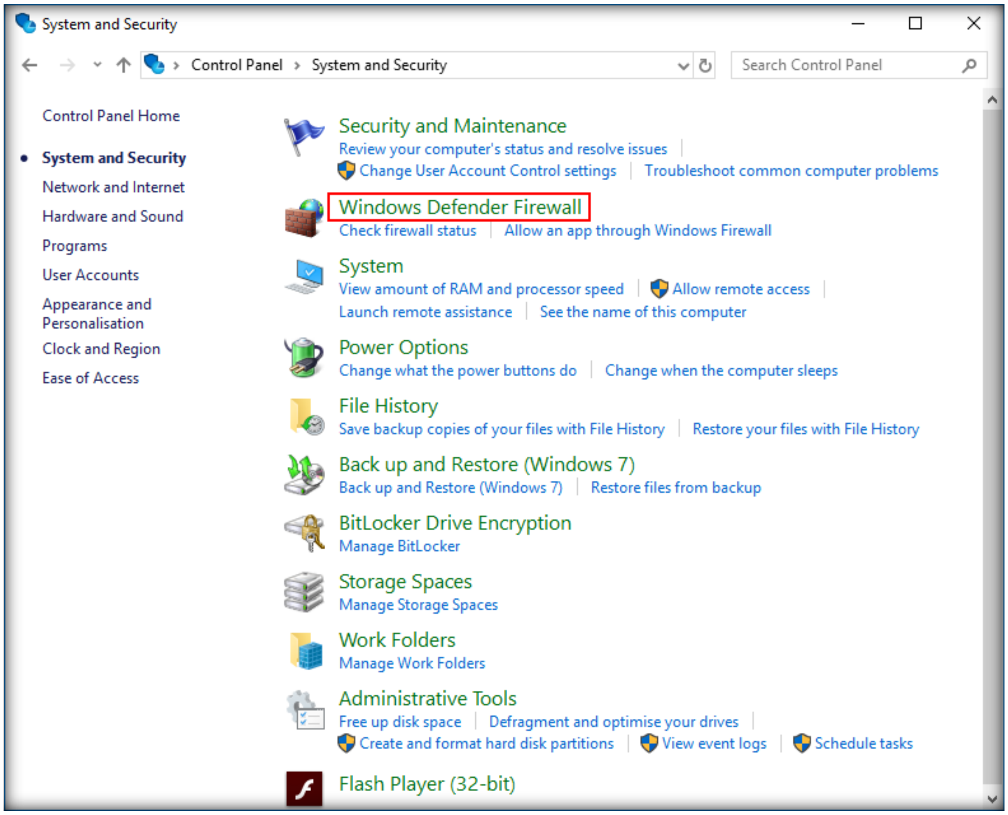
1. Turn on the **Window 10** virtual machine and log in with the credentials **Admin** and **Pa$$w0rd**.

   **Note**: If a **Windows 10 – VMware Workstation** pop-up appears, click **Yes**.

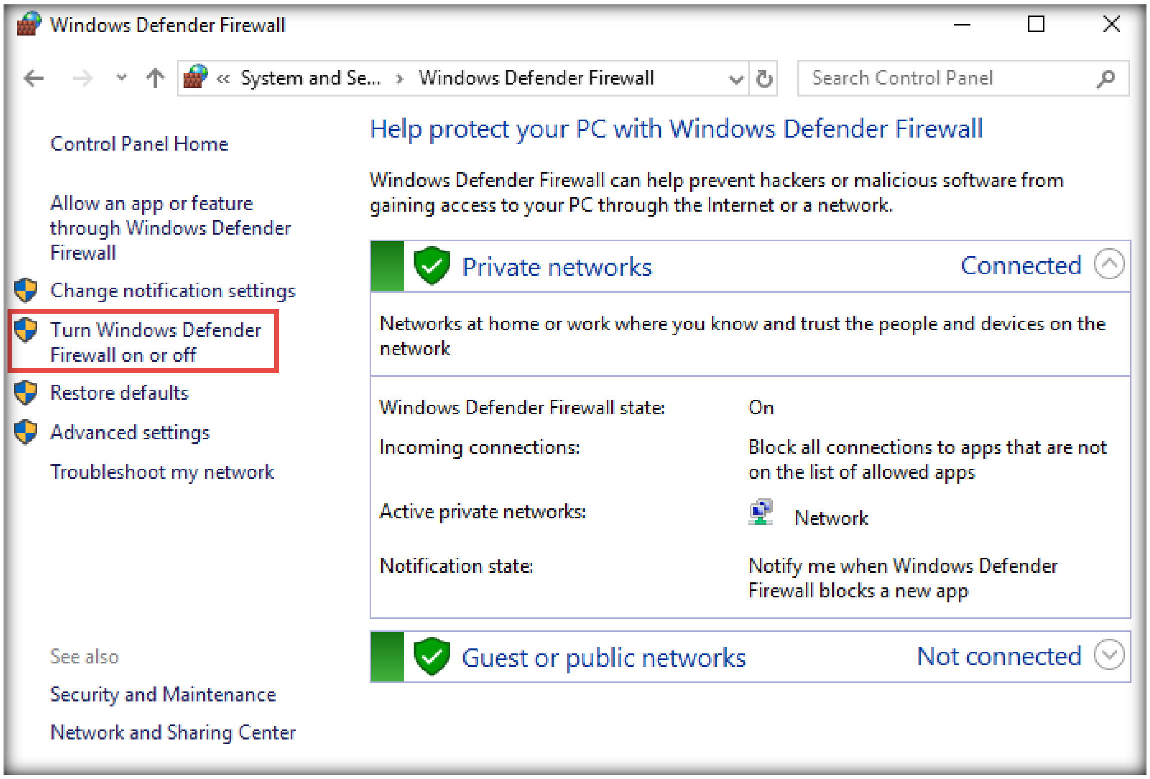
2. Open **Control Panel** and click **System and Security**.


Control Panel
Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
Save backup copies of your files with File History
Back up and Restore (Windows 7)
Network and Internet
View network status and tasks
Hardware and Sound
View devices and printers
Add a device
Programs
Uninstall a program
User Accounts
Change account type
Appearance and Personalisation
Clock and Region
Change date, time or number formats
Ease of Access
Let Windows suggest settings
Optimise visual display

3. Click **Windows Defender Firewall** in the **System and Security** window.


System and Security
Control Panel › System and Security
Search Control Panel
Control Panel Home
System and Security
Network and Internet
Hardware and Sound
Programs
User Accounts
Appearance and Personalisation
Clock and Region
Ease of Access
Security and Maintenance
Review your computer's status and resolve issues
Change User Account Control settings
Troubleshoot common computer problems
Windows Defender Firewall
Check firewall status
Allow an app through Windows Firewall
System
View amount of RAM and processor speed
Allow remote access
Launch remote assistance
See the name of this computer
Power Options
Change what the power buttons do
Change when the computer sleeps
File History
Save backup copies of your files with File History
Restore your files with File History
Back up and Restore (Windows 7)
Back up and Restore (Windows 7)
Restore files from backup
BitLocker Drive Encryption
Manage BitLocker
Storage Spaces
Manage Storage Spaces
Work Folders
Manage Work Folders
Administrative Tools
Free up disk space
Defragment and optimise your drives
Create and format hard disk partitions
View event logs
Schedule tasks
Flash Player (32-bit)

4. In the **Windows Defender Firewall** window, click **Turn Windows Defender Firewall on or off** link in the left-hand pane of the window.



Windows Defender Firewall

« System and Se... › Windows Defender Firewall

Search Control Panel

Control Panel Home

Allow an app or feature through Windows Defender Firewall

Change notification settings

Turn Windows Defender Firewall on or off

Restore defaults

Advanced settings

Troubleshoot my network

See also

Security and Maintenance

Network and Sharing Center

Help protect your PC with Windows Defender Firewall

Windows Defender Firewall can help prevent hackers or malicious software from gaining access to your PC through the Internet or a network.

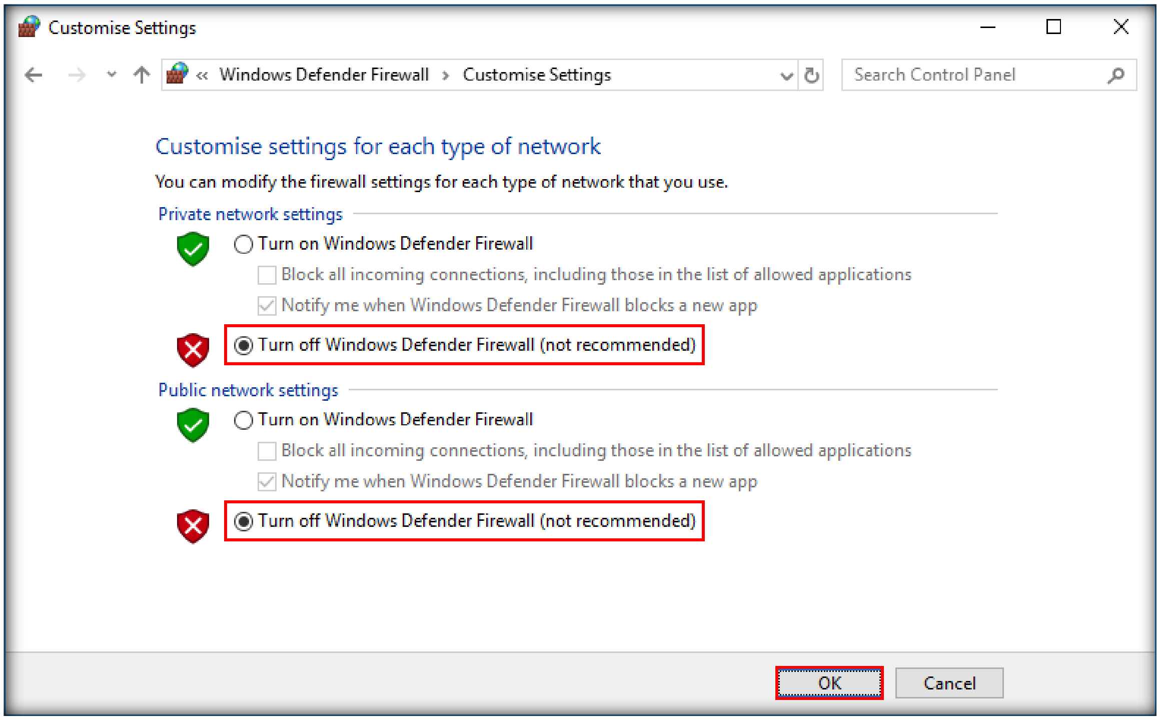
Private networks — Connected

Networks at home or work where you know and trust the people and devices on the network

| | |
|---|---|
| Windows Defender Firewall state: | On |
| Incoming connections: | Block all connections to apps that are not on the list of allowed apps |
| Active private networks: | Network |
| Notification state: | Notify me when Windows Defender Firewall blocks a new app |

Guest or public networks — Not connected

5. In the **Customise Settings** window, select the **Turn off Windows Defender Firewall (not recommended)** radio button for all Domain, Private, and Public network settings and click **OK**.



Customise Settings

« Windows Defender Firewall › Customise Settings

Search Control Panel

Customise settings for each type of network

You can modify the firewall settings for each type of network that you use.

Private network settings

○ Turn on Windows Defender Firewall

☐ Block all incoming connections, including those in the list of allowed applications

☑ Notify me when Windows Defender Firewall blocks a new app

● Turn off Windows Defender Firewall (not recommended)

Public network settings

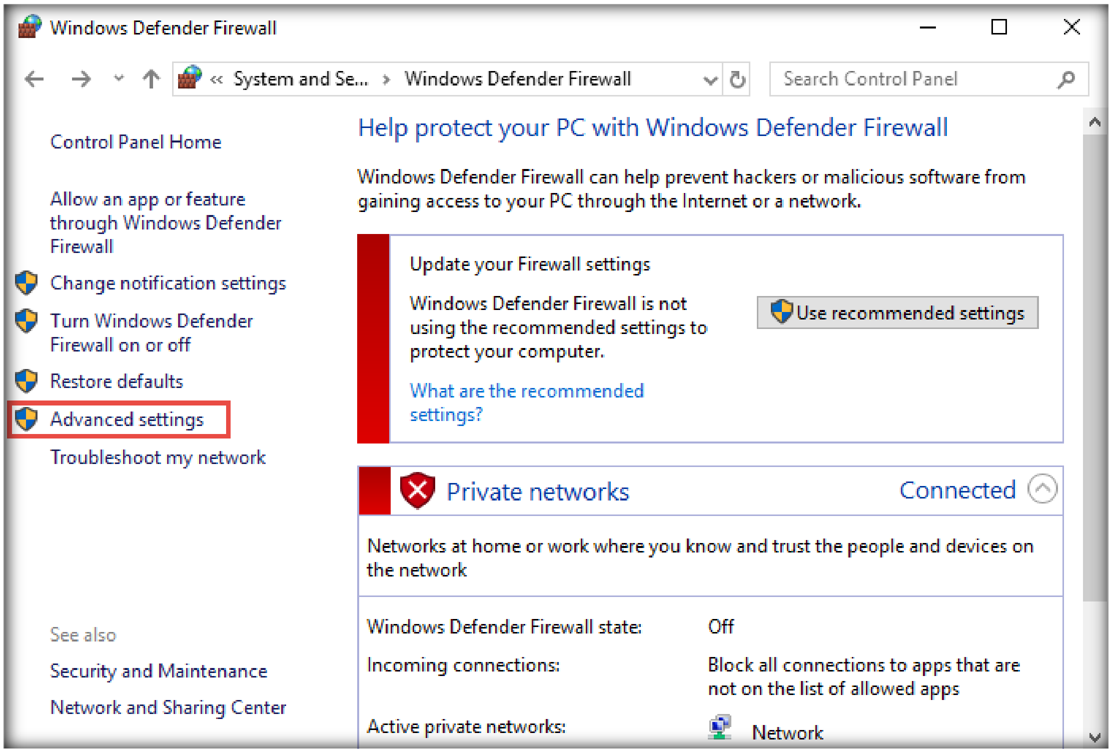
○ Turn on Windows Defender Firewall

☐ Block all incoming connections, including those in the list of allowed applications

☑ Notify me when Windows Defender Firewall blocks a new app

● Turn off Windows Defender Firewall (not recommended)

6. Again, in the **Windows Defender Firewall** window, click the **Advanced settings** link in the left-hand pane.


Windows Defender Firewall
« System and Se... › Windows Defender Firewall
Search Control Panel
Control Panel Home
Allow an app or feature through Windows Defender Firewall
Change notification settings
Turn Windows Defender Firewall on or off
Restore defaults
Advanced settings
Troubleshoot my network
See also
Security and Maintenance
Network and Sharing Center
Use recommended settings
What are the recommended settings?
Private networks
Connected

Help protect your PC with Windows Defender Firewall

Windows Defender Firewall can help prevent hackers or malicious software from gaining access to your PC through the Internet or a network.

Update your Firewall settings

Windows Defender Firewall is not using the recommended settings to protect your computer.

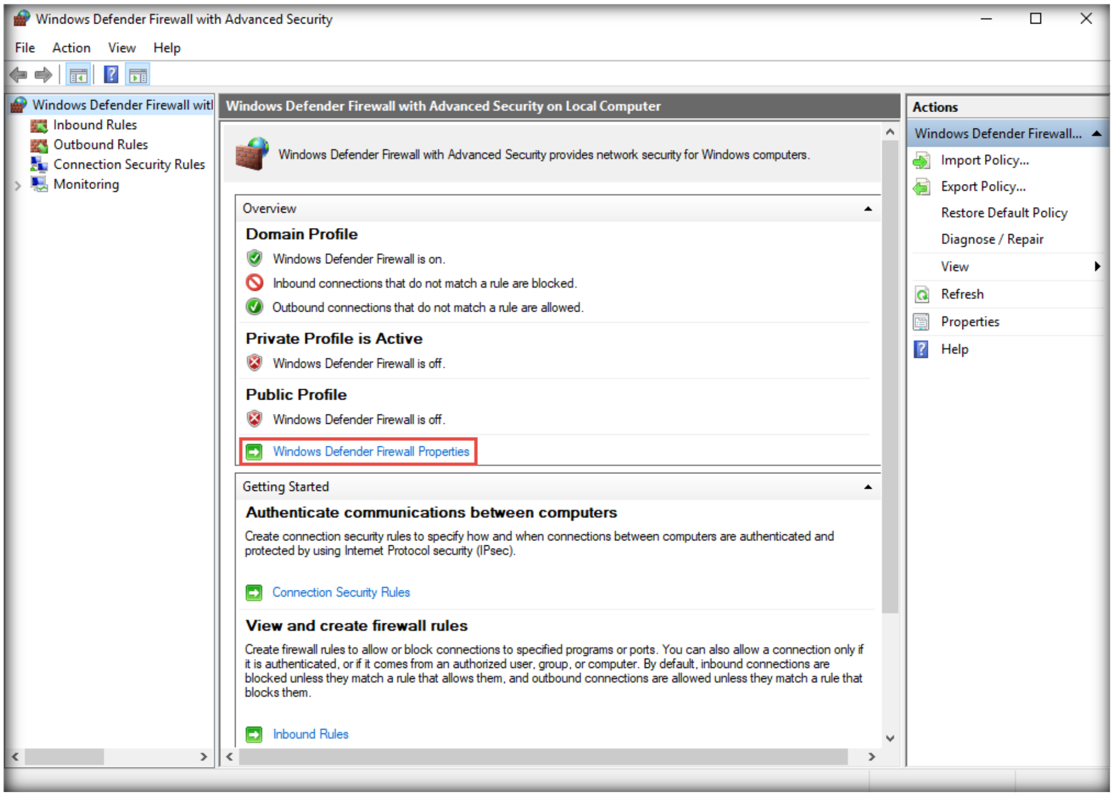
Networks at home or work where you know and trust the people and devices on the network

Windows Defender Firewall state: Off

Incoming connections: Block all connections to apps that are not on the list of allowed apps

Active private networks: Network

7. Once the **Windows Defender Firewall with Advanced Security** window appears on the screen, click the **Windows Defender Firewall Properties** link in the **Overview** section.


Windows Defender Firewall with Advanced Security
File Action View Help
Windows Defender Firewall witl
Inbound Rules
Outbound Rules
Connection Security Rules
Monitoring
Windows Defender Firewall with Advanced Security on Local Computer
Actions
Windows Defender Firewall...
Import Policy...
Export Policy...
Restore Default Policy
Diagnose / Repair
View
Refresh
Properties
Help
Overview
Getting Started
Windows Defender Firewall Properties
Connection Security Rules
Inbound Rules

Windows Defender Firewall with Advanced Security provides network security for Windows computers.

Domain Profile
- Windows Defender Firewall is on.
- Inbound connections that do not match a rule are blocked.
- Outbound connections that do not match a rule are allowed.

Private Profile is Active
- Windows Defender Firewall is off.

Public Profile
- Windows Defender Firewall is off.

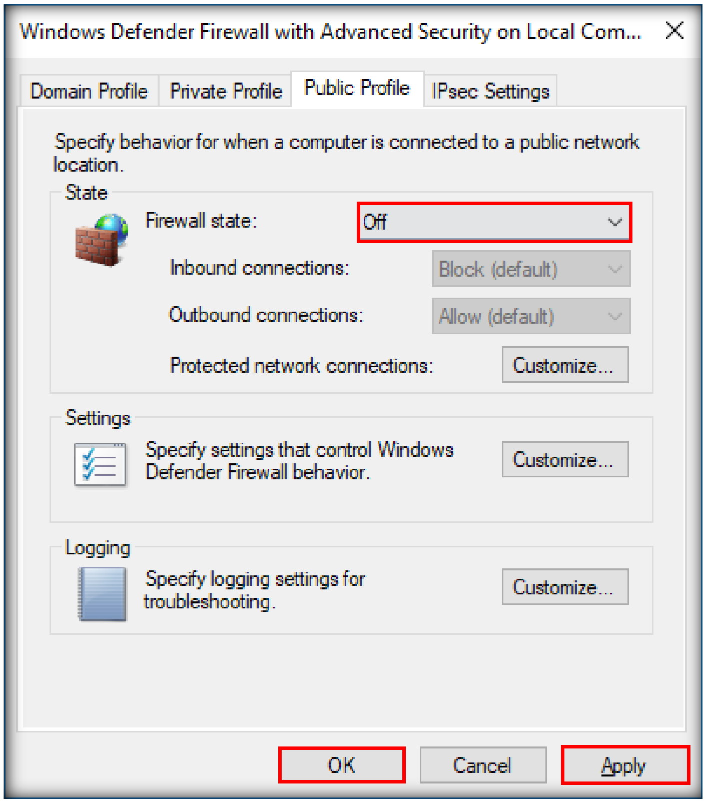
Authenticate communications between computers

Create connection security rules to specify how and when connections between computers are authenticated and protected by using Internet Protocol security (IPsec).

View and create firewall rules

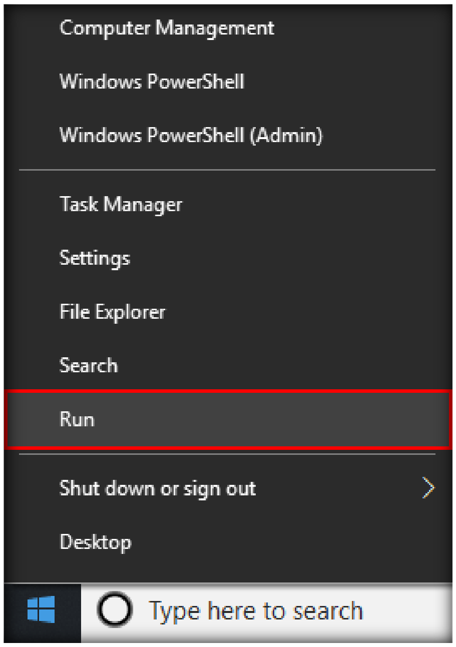
Create firewall rules to allow or block connections to specified programs or ports. You can also allow a connection only if it is authenticated, or if it comes from an authorized user, group, or computer. By default, inbound connections are blocked unless they match a rule that allows them, and outbound connections are allowed unless they match a rule that blocks them.

8. When the **Windows Defender Firewall with Advanced Security on Local Computer Properties** window appears, in the **Domain Profile** tab, choose **Off** from the **Firewall state** drop-down list. Then, navigate to the **Private Profile** and **Public Profile** tabs and ensure that **Firewall state** is **Off**. Click **Apply**, and then click **OK**.

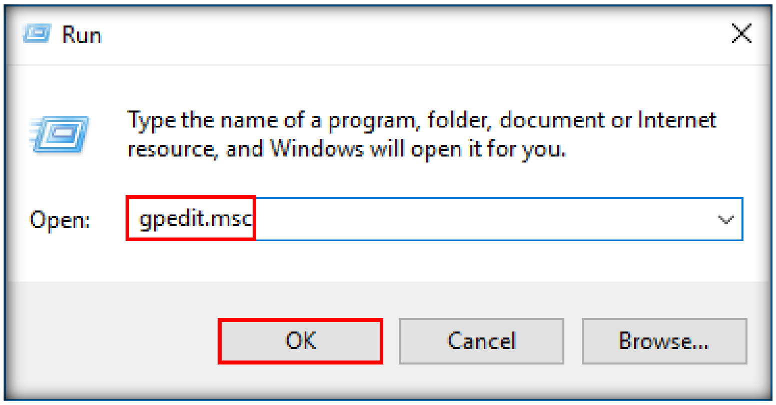

Windows Defender Firewall with Advanced Security on Local Com...
Domain Profile
Private Profile
Public Profile
IPsec Settings
Specify behavior for when a computer is connected to a public network location.
State
Firewall state:
Off
Inbound connections:
Block (default)
Outbound connections:
Allow (default)
Protected network connections:
Customize...
Settings
Specify settings that control Windows Defender Firewall behavior.
Customize...
Logging
Specify logging settings for troubleshooting.
Customize...
OK
Cancel
Apply

9. Close all windows.

10. Right-click the **Windows** button in the lower-left corner of the screen and click **Run**.


Computer Management
Windows PowerShell
Windows PowerShell (Admin)
Task Manager
Settings
File Explorer
Search
Run
Shut down or sign out
Desktop
Type here to search

11. The **Run** window appears. Type **gpedit.msc** and click **OK**.

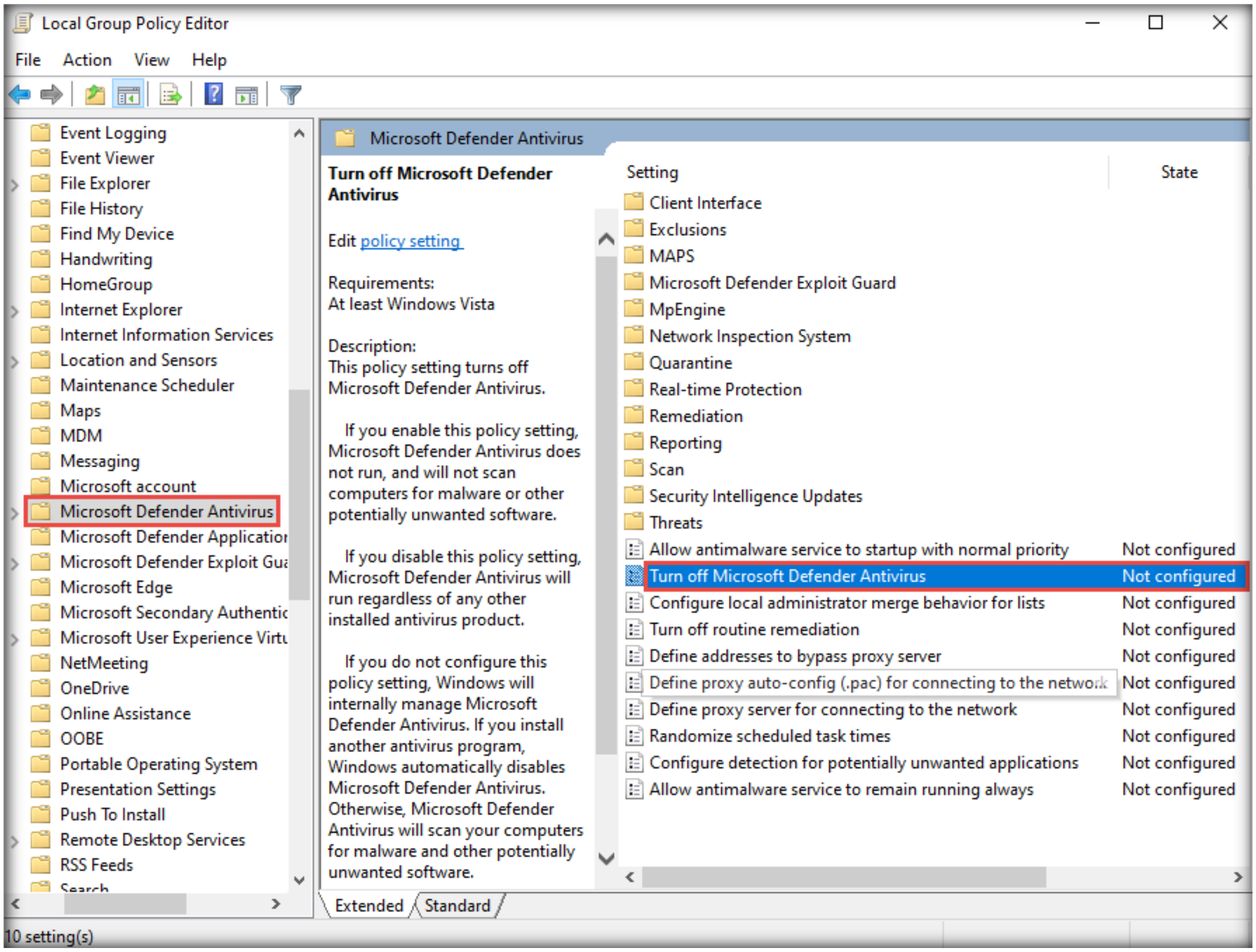

Run
OK
Cancel
Browse...

Type the name of a program, folder, document or Internet resource, and Windows will open it for you.

Open: gpedit.msc

12. The **Local Group Policy Editor** window appears. In the left-hand pane, navigate to **Local Computer Policy → Computer Configuration → Administrative Templates → Windows Components → Microsoft Defender Antivirus**. Double-click the **Turn off Microsoft Defender Antivirus** policy in the right-hand pane of the window, as shown in the screenshot.

**Note**: If you are using an older version of **Windows 10**, you might see **Windows Defender Antivirus** folder instead of **Microsoft Defender Antivirus**.


Local Group Policy Editor
File
Action
View
Help
Event Logging
Event Viewer
File Explorer
File History
Find My Device
Handwriting
HomeGroup
Internet Explorer
Internet Information Services
Location and Sensors
Maintenance Scheduler
Maps
MDM
Messaging
Microsoft account
Microsoft Defender Antivirus
Microsoft Defender Applicatior
Microsoft Defender Exploit Gu
Microsoft Edge
Microsoft Secondary Authentic
Microsoft User Experience Virtu
NetMeeting
OneDrive
Online Assistance
OOBE
Portable Operating System
Presentation Settings
Push To Install
Remote Desktop Services
RSS Feeds
Search
Microsoft Defender Antivirus
Extended
Standard
10 setting(s)

**Turn off Microsoft Defender Antivirus**

Edit policy setting

Requirements:
At least Windows Vista

Description:
This policy setting turns off Microsoft Defender Antivirus.

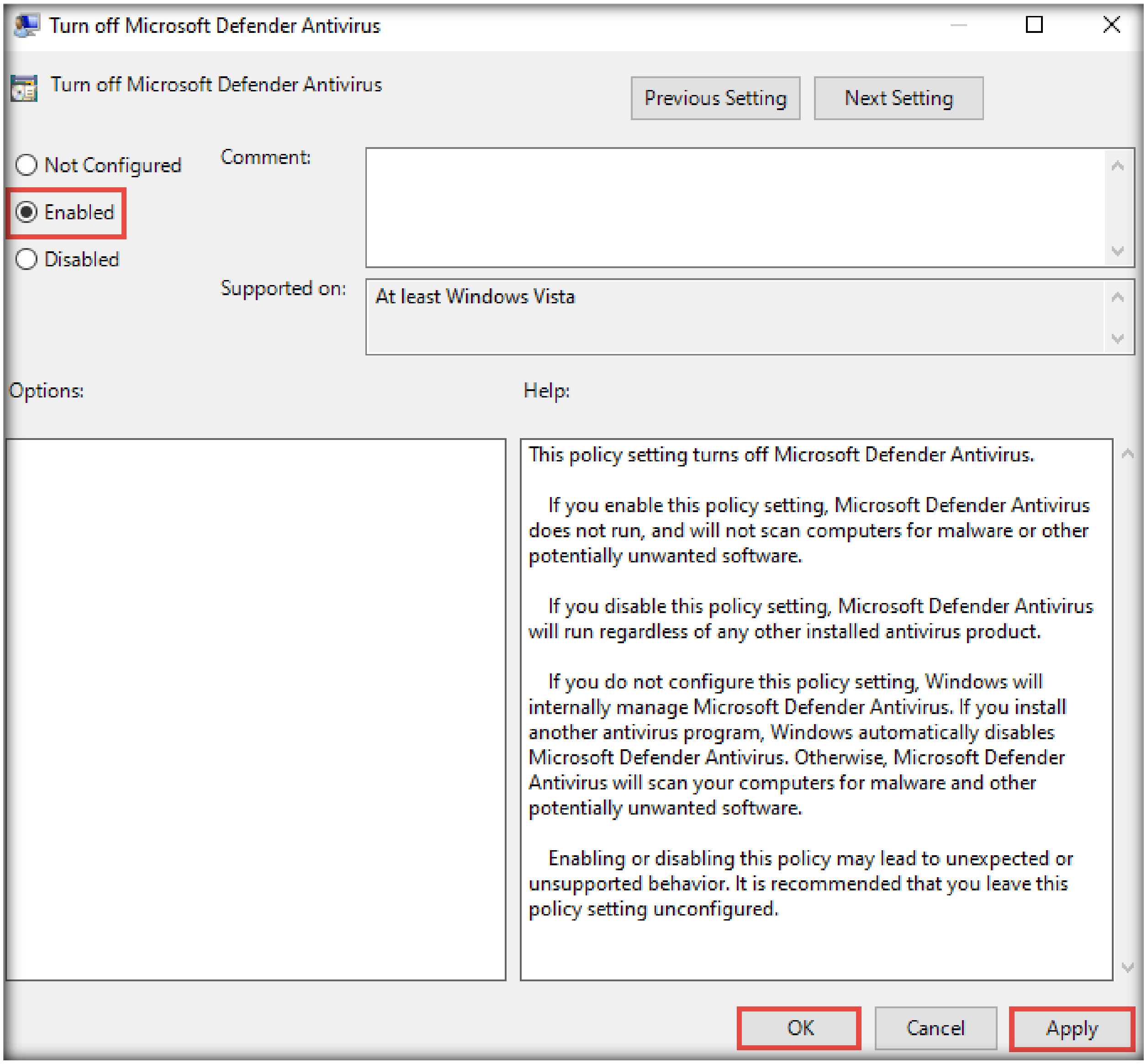
If you enable this policy setting, Microsoft Defender Antivirus does not run, and will not scan computers for malware or other potentially unwanted software.

If you disable this policy setting, Microsoft Defender Antivirus will run regardless of any other installed antivirus product.

If you do not configure this policy setting, Windows will internally manage Microsoft Defender Antivirus. If you install another antivirus program, Windows automatically disables Microsoft Defender Antivirus. Otherwise, Microsoft Defender Antivirus will scan your computers for malware and other potentially unwanted software.

| Setting | State |
|---|---|
| Client Interface | |
| Exclusions | |
| MAPS | |
| Microsoft Defender Exploit Guard | |
| MpEngine | |
| Network Inspection System | |
| Quarantine | |
| Real-time Protection | |
| Remediation | |
| Reporting | |
| Scan | |
| Security Intelligence Updates | |
| Threats | |
| Allow antimalware service to startup with normal priority | Not configured |
| Turn off Microsoft Defender Antivirus | Not configured |
| Configure local administrator merge behavior for lists | Not configured |
| Turn off routine remediation | Not configured |
| Define addresses to bypass proxy server | Not configured |
| Define proxy auto-config (.pac) for connecting to the network | Not configured |
| Define proxy server for connecting to the network | Not configured |
| Randomize scheduled task times | Not configured |
| Configure detection for potentially unwanted applications | Not configured |
| Allow antimalware service to remain running always | Not configured |

13. When the **Turn off Microsoft Defender Antivirus** window appears, choose the **Enabled** radio button, click **Apply**, and then **OK** to turn off Microsoft Defender Antivirus.


Turn off Microsoft Defender Antivirus
Turn off Microsoft Defender Antivirus
Previous Setting
Next Setting
OK
Cancel
Apply

○ Not Configured
● Enabled
○ Disabled

Comment:

Supported on: At least Windows Vista

Options:

Help:

This policy setting turns off Microsoft Defender Antivirus.

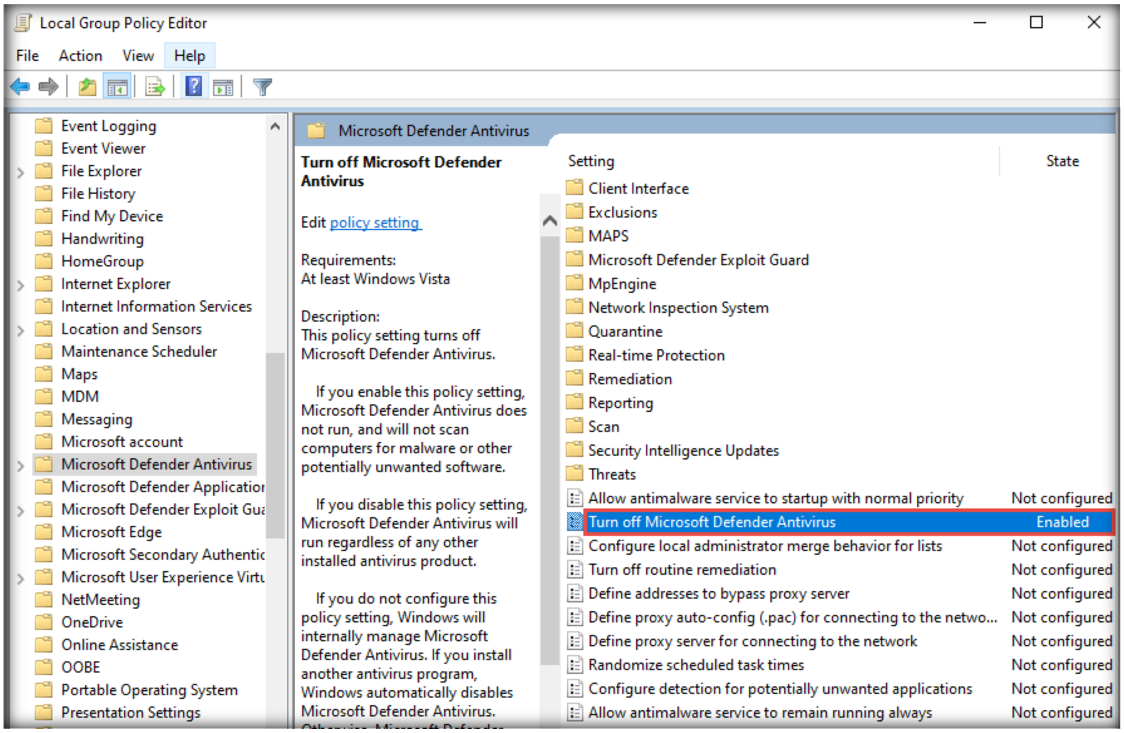
If you enable this policy setting, Microsoft Defender Antivirus does not run, and will not scan computers for malware or other potentially unwanted software.

If you disable this policy setting, Microsoft Defender Antivirus will run regardless of any other installed antivirus product.

If you do not configure this policy setting, Windows will internally manage Microsoft Defender Antivirus. If you install another antivirus program, Windows automatically disables Microsoft Defender Antivirus. Otherwise, Microsoft Defender Antivirus will scan your computers for malware and other potentially unwanted software.

Enabling or disabling this policy may lead to unexpected or unsupported behavior. It is recommended that you leave this policy setting unconfigured.

14. **Microsoft Defender Antivirus** is turned off.


Local Group Policy Editor
File
Action
View
Help
Event Logging
Event Viewer
File Explorer
File History
Find My Device
Handwriting
HomeGroup
Internet Explorer
Internet Information Services
Location and Sensors
Maintenance Scheduler
Maps
MDM
Messaging
Microsoft account
Microsoft Defender Antivirus
Microsoft Defender Applicatior
Microsoft Defender Exploit Gu
Microsoft Edge
Microsoft Secondary Authentic
Microsoft User Experience Virt
NetMeeting
OneDrive
Online Assistance
OOBE
Portable Operating System
Presentation Settings
Microsoft Defender Antivirus

**Turn off Microsoft Defender Antivirus**

Edit policy setting

Requirements:
At least Windows Vista

Description:
This policy setting turns off Microsoft Defender Antivirus.

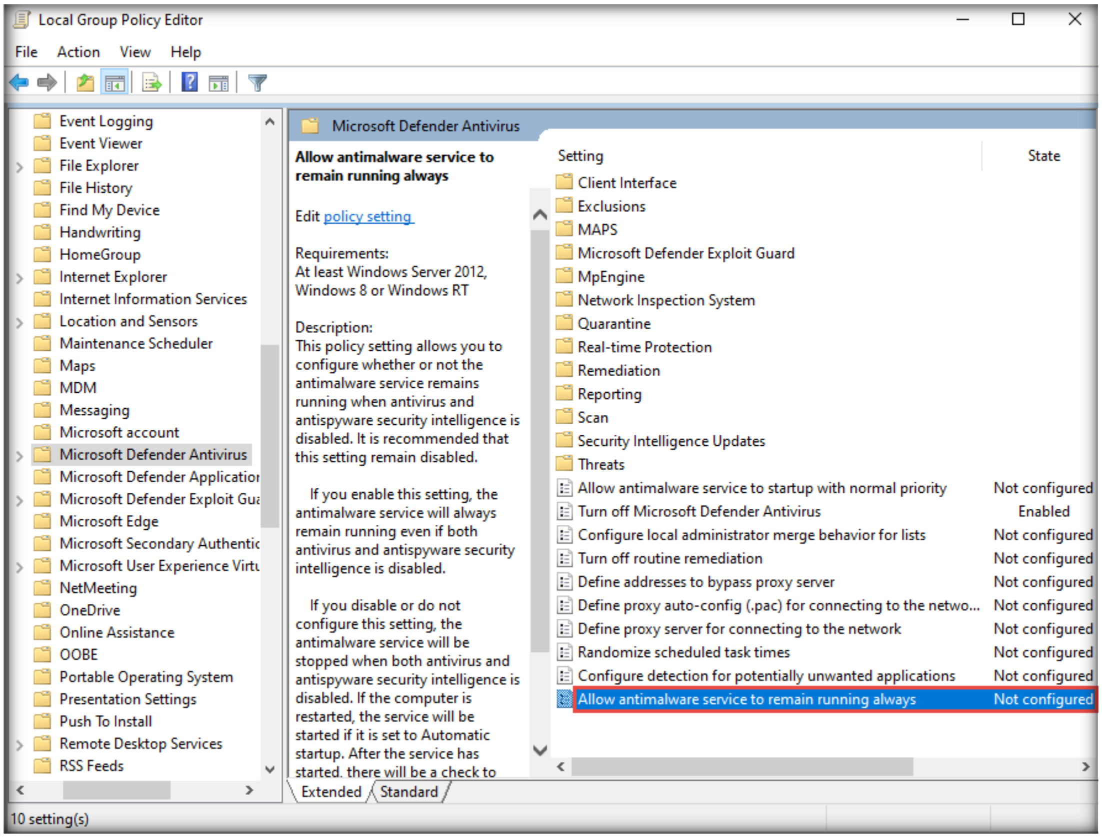
If you enable this policy setting, Microsoft Defender Antivirus does not run, and will not scan computers for malware or other potentially unwanted software.

If you disable this policy setting, Microsoft Defender Antivirus will run regardless of any other installed antivirus product.

If you do not configure this policy setting, Windows will internally manage Microsoft Defender Antivirus. If you install another antivirus program, Windows automatically disables Microsoft Defender Antivirus.

| Setting | State |
|---|---|
| Client Interface | |
| Exclusions | |
| MAPS | |
| Microsoft Defender Exploit Guard | |
| MpEngine | |
| Network Inspection System | |
| Quarantine | |
| Real-time Protection | |
| Remediation | |
| Reporting | |
| Scan | |
| Security Intelligence Updates | |
| Threats | |
| Allow antimalware service to startup with normal priority | Not configured |
| Turn off Microsoft Defender Antivirus | Enabled |
| Configure local administrator merge behavior for lists | Not configured |
| Turn off routine remediation | Not configured |
| Define addresses to bypass proxy server | Not configured |
| Define proxy auto-config (.pac) for connecting to the netwo... | Not configured |
| Define proxy server for connecting to the network | Not configured |
| Randomize scheduled task times | Not configured |
| Configure detection for potentially unwanted applications | Not configured |
| Allow antimalware service to remain running always | Not configured |

15. In the **Local Group Policy Editor** window, double-click **Allow antimalware service to remain running always**.


Local Group Policy Editor
File
Action
View
Help
Event Logging
Event Viewer
File Explorer
File History
Find My Device
Handwriting
HomeGroup
Internet Explorer
Internet Information Services
Location and Sensors
Maintenance Scheduler
Maps
MDM
Messaging
Microsoft account
Microsoft Defender Antivirus
Microsoft Defender Applicatior
Microsoft Defender Exploit Gu
Microsoft Edge
Microsoft Secondary Authentic
Microsoft User Experience Virt
NetMeeting
OneDrive
Online Assistance
OOBE
Portable Operating System
Presentation Settings
Push To Install
Remote Desktop Services
RSS Feeds
Microsoft Defender Antivirus
Extended
Standard
10 setting(s)

**Allow antimalware service to remain running always**

Edit policy setting

Requirements:
At least Windows Server 2012, Windows 8 or Windows RT

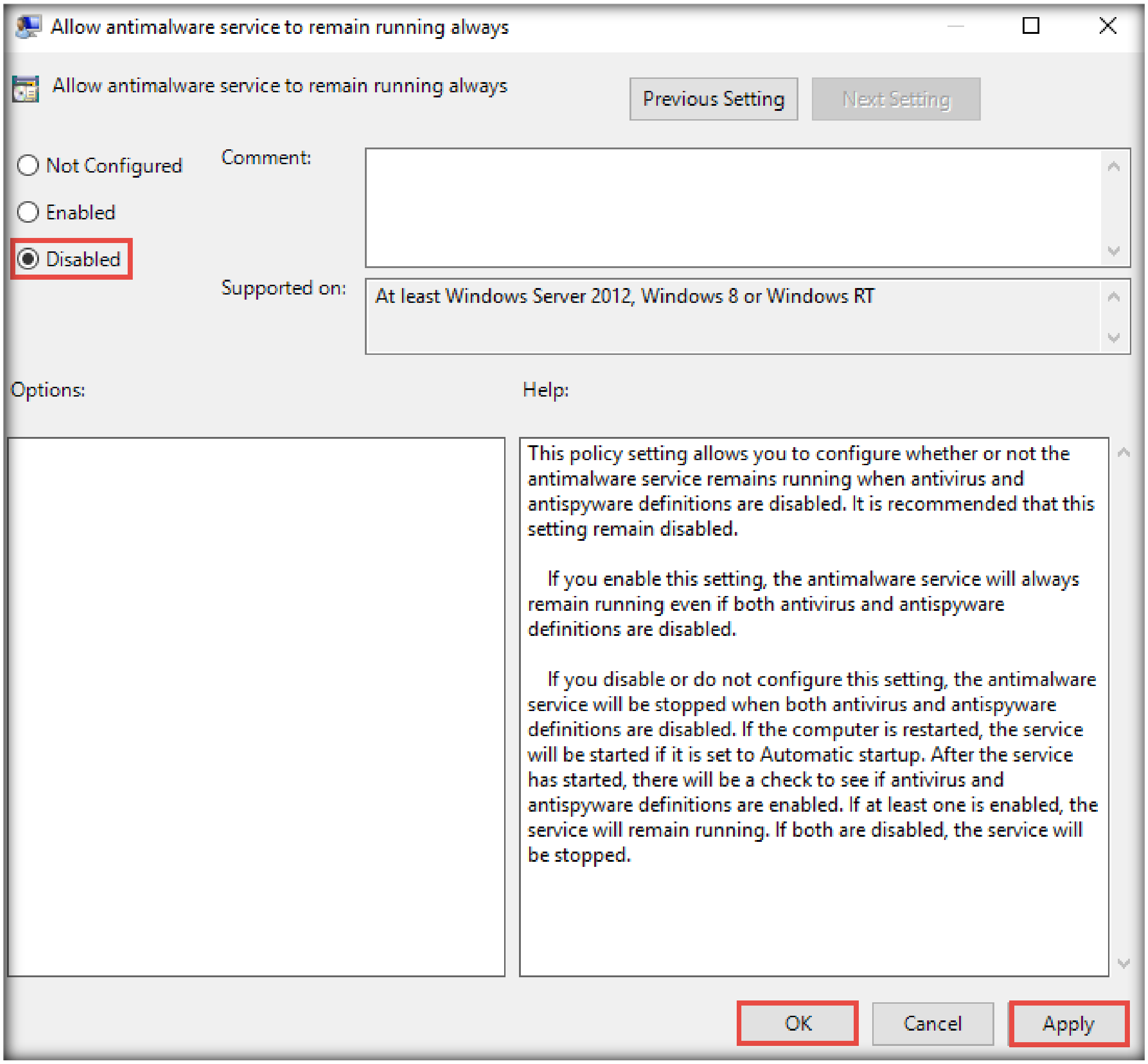
Description:
This policy setting allows you to configure whether or not the antimalware service remains running when antivirus and antispyware security intelligence is disabled. It is recommended that this setting remain disabled.

If you enable this setting, the antimalware service will always remain running even if both antivirus and antispyware security intelligence is disabled.

If you disable or do not configure this setting, the antimalware service will be stopped when both antivirus and antispyware security intelligence is disabled. If the computer is restarted, the service will be started if it is set to Automatic startup. After the service has started, there will be a check to

| Setting | State |
|---|---|
| Client Interface | |
| Exclusions | |
| MAPS | |
| Microsoft Defender Exploit Guard | |
| MpEngine | |
| Network Inspection System | |
| Quarantine | |
| Real-time Protection | |
| Remediation | |
| Reporting | |
| Scan | |
| Security Intelligence Updates | |
| Threats | |
| Allow antimalware service to startup with normal priority | Not configured |
| Turn off Microsoft Defender Antivirus | Enabled |
| Configure local administrator merge behavior for lists | Not configured |
| Turn off routine remediation | Not configured |
| Define addresses to bypass proxy server | Not configured |
| Define proxy auto-config (.pac) for connecting to the netwo... | Not configured |
| Define proxy server for connecting to the network | Not configured |
| Randomize scheduled task times | Not configured |
| Configure detection for potentially unwanted applications | Not configured |
| Allow antimalware service to remain running always | Not configured |

16. When the **Allow antimalware service to remain running always** window appears, choose the **Disabled** radio button and click **Apply**, and then **OK**.



Allow antimalware service to remain running always
Previous Setting
Next Setting
Comment:
Supported on:
Options:
Help:
OK
Cancel
Apply

Allow antimalware service to remain running always

○ Not Configured
○ Enabled
● Disabled

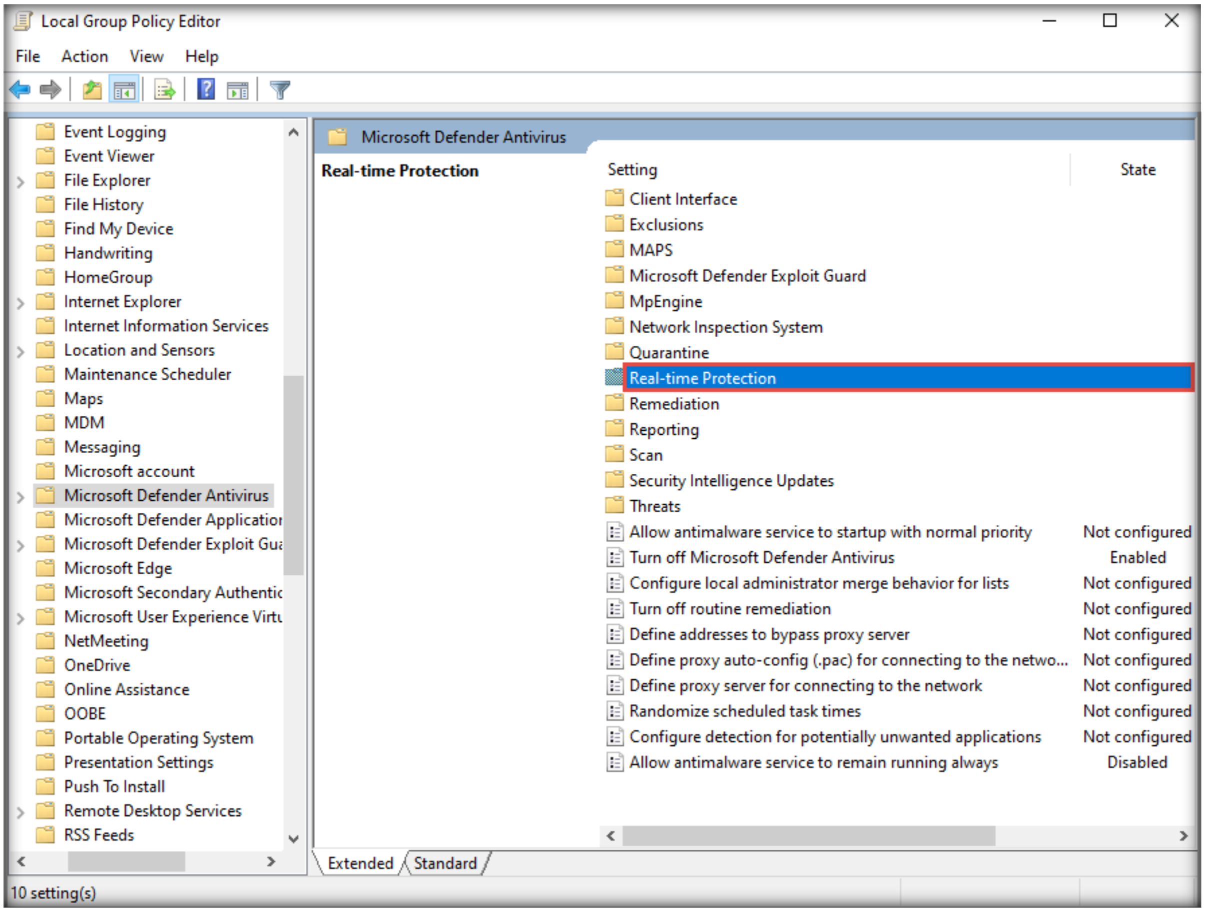
Supported on: At least Windows Server 2012, Windows 8 or Windows RT

This policy setting allows you to configure whether or not the antimalware service remains running when antivirus and antispyware definitions are disabled. It is recommended that this setting remain disabled.

If you enable this setting, the antimalware service will always remain running even if both antivirus and antispyware definitions are disabled.

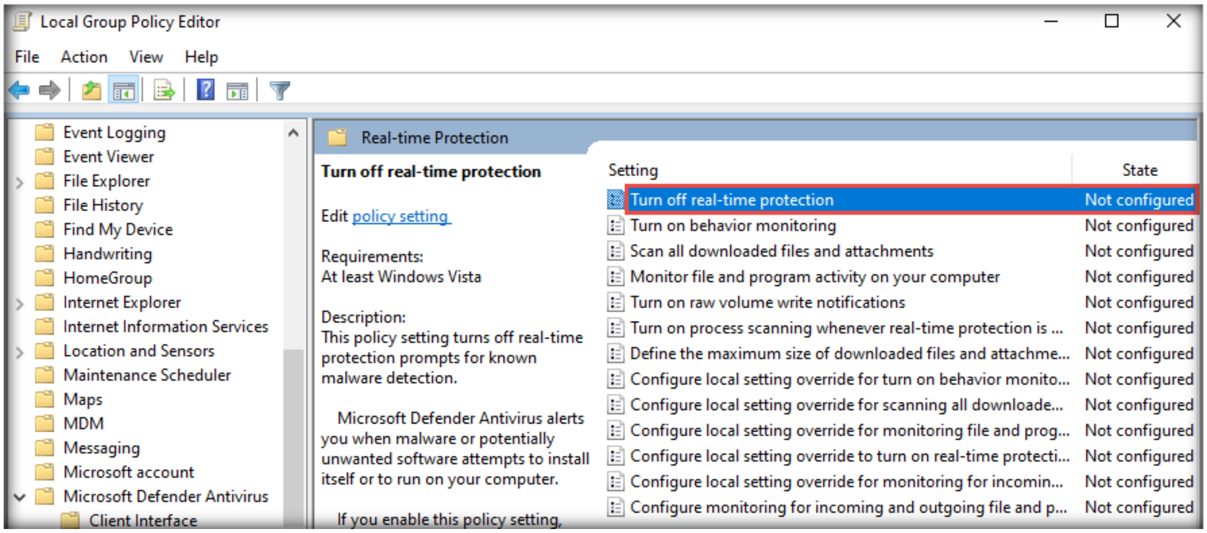
If you disable or do not configure this setting, the antimalware service will be stopped when both antivirus and antispyware definitions are disabled. If the computer is restarted, the service will be started if it is set to Automatic startup. After the service has started, there will be a check to see if antivirus and antispyware definitions are enabled. If at least one is enabled, the service will remain running. If both are disabled, the service will be stopped.

17. In the **Local Group Policy Editor** window, double-click the **Real-time Protection** folder.


Local Group Policy Editor
File Action View Help
Event Logging
Event Viewer
File Explorer
File History
Find My Device
Handwriting
HomeGroup
Internet Explorer
Internet Information Services
Location and Sensors
Maintenance Scheduler
Maps
MDM
Messaging
Microsoft account
Microsoft Defender Antivirus
Microsoft Defender Applicatior
Microsoft Defender Exploit Gua
Microsoft Edge
Microsoft Secondary Authentic
Microsoft User Experience Virtu
NetMeeting
OneDrive
Online Assistance
OOBE
Portable Operating System
Presentation Settings
Push To Install
Remote Desktop Services
RSS Feeds
Microsoft Defender Antivirus
Real-time Protection
Extended
Standard
10 setting(s)

| Setting | State |
|---|---|
| Client Interface | |
| Exclusions | |
| MAPS | |
| Microsoft Defender Exploit Guard | |
| MpEngine | |
| Network Inspection System | |
| Quarantine | |
| Real-time Protection | |
| Remediation | |
| Reporting | |
| Scan | |
| Security Intelligence Updates | |
| Threats | |
| Allow antimalware service to startup with normal priority | Not configured |
| Turn off Microsoft Defender Antivirus | Enabled |
| Configure local administrator merge behavior for lists | Not configured |
| Turn off routine remediation | Not configured |
| Define addresses to bypass proxy server | Not configured |
| Define proxy auto-config (.pac) for connecting to the netwo... | Not configured |
| Define proxy server for connecting to the network | Not configured |
| Randomize scheduled task times | Not configured |
| Configure detection for potentially unwanted applications | Not configured |
| Allow antimalware service to remain running always | Disabled |

18. In the **Real-time Protection** window, double-click **Turn off real-time protection**.


Local Group Policy Editor
File Action View Help
Event Logging
Event Viewer
File Explorer
File History
Find My Device
Handwriting
HomeGroup
Internet Explorer
Internet Information Services
Location and Sensors
Maintenance Scheduler
Maps
MDM
Messaging
Microsoft account
Microsoft Defender Antivirus
Client Interface
Real-time Protection

**Turn off real-time protection**

Edit policy setting

Requirements:
At least Windows Vista

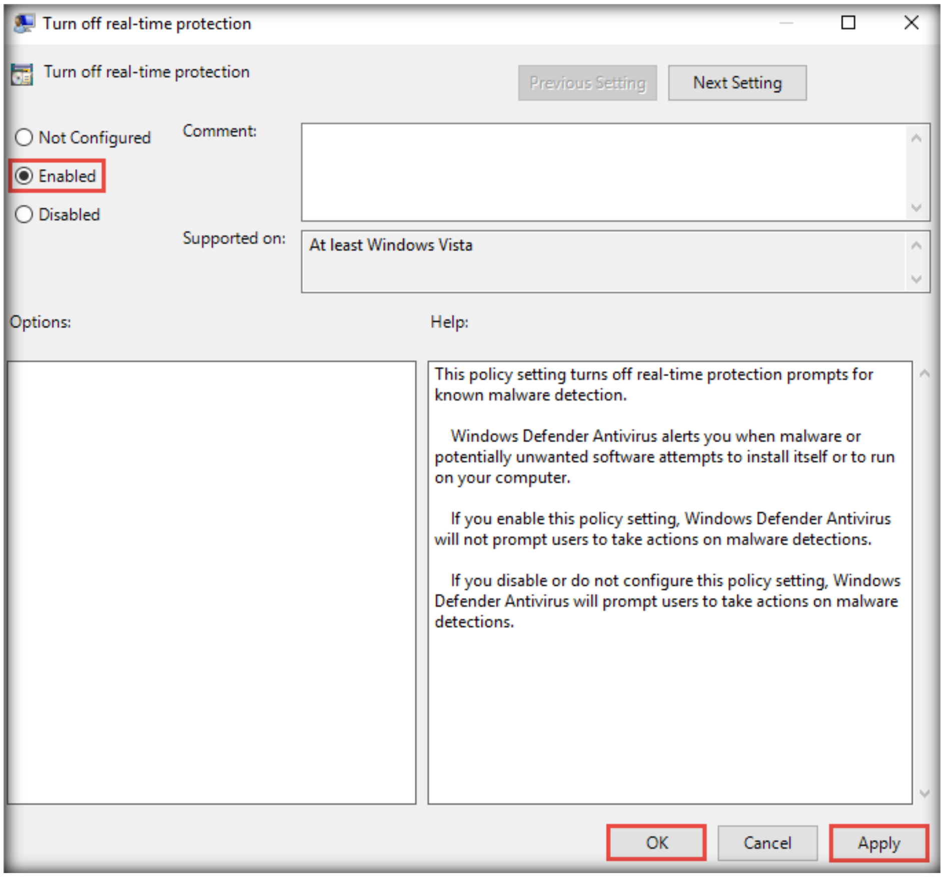
Description:
This policy setting turns off real-time protection prompts for known malware detection.

Microsoft Defender Antivirus alerts you when malware or potentially unwanted software attempts to install itself or to run on your computer.

If you enable this policy setting,

| Setting | State |
|---|---|
| Turn off real-time protection | Not configured |
| Turn on behavior monitoring | Not configured |
| Scan all downloaded files and attachments | Not configured |
| Monitor file and program activity on your computer | Not configured |
| Turn on raw volume write notifications | Not configured |
| Turn on process scanning whenever real-time protection is ... | Not configured |
| Define the maximum size of downloaded files and attachme... | Not configured |
| Configure local setting override for turn on behavior monito... | Not configured |
| Configure local setting override for scanning all downloade... | Not configured |
| Configure local setting override for monitoring file and prog... | Not configured |
| Configure local setting override to turn on real-time protecti... | Not configured |
| Configure local setting override for monitoring for incomin... | Not configured |
| Configure monitoring for incoming and outgoing file and p... | Not configured |

19. When the **Turn off real-time protection** window appears, choose the **Enabled** radio button, click **Apply**, and then **OK**.



Turn off real-time protection
Turn off real-time protection
Previous Setting
Next Setting
○ Not Configured
● Enabled
○ Disabled
Comment:
Supported on:
Options:
Help:
OK
Cancel
Apply

Supported on: At least Windows Vista

This policy setting turns off real-time protection prompts for known malware detection.

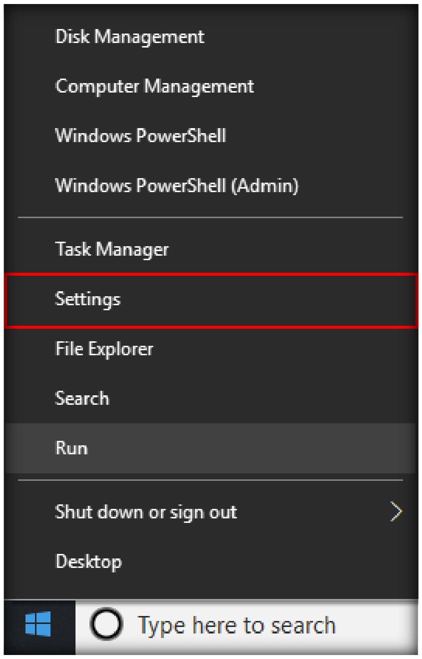
Windows Defender Antivirus alerts you when malware or potentially unwanted software attempts to install itself or to run on your computer.

If you enable this policy setting, Windows Defender Antivirus will not prompt users to take actions on malware detections.

If you disable or do not configure this policy setting, Windows Defender Antivirus will prompt users to take actions on malware detections.

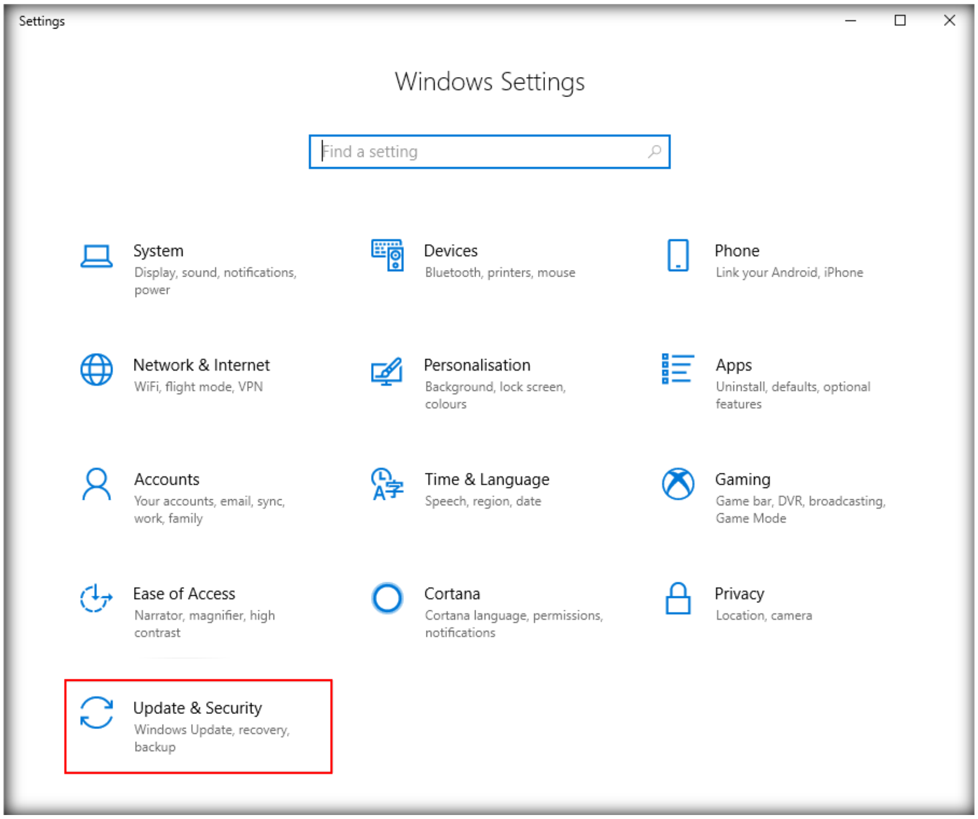
20. Close all windows.

21. Right-click the **Windows** button in the lower-left corner of the screen and click **Settings**.

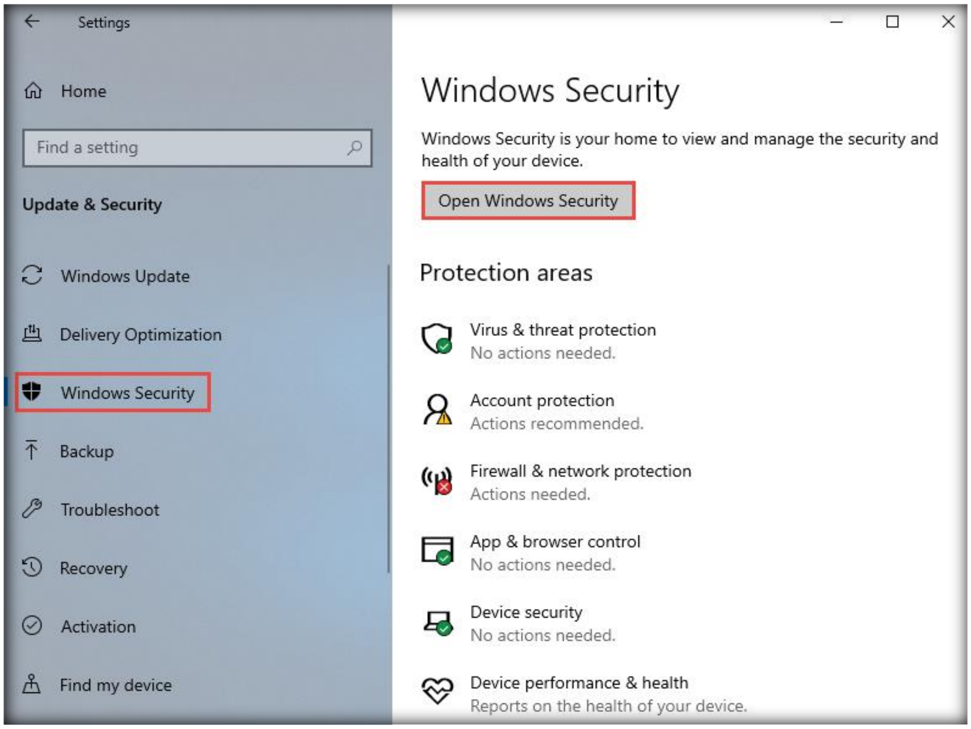


Disk Management
Computer Management
Windows PowerShell
Windows PowerShell (Admin)
Task Manager
Settings
File Explorer
Search
Run
Shut down or sign out
Desktop
Type here to search

22. In the **Settings** window, click **Update & Security**.

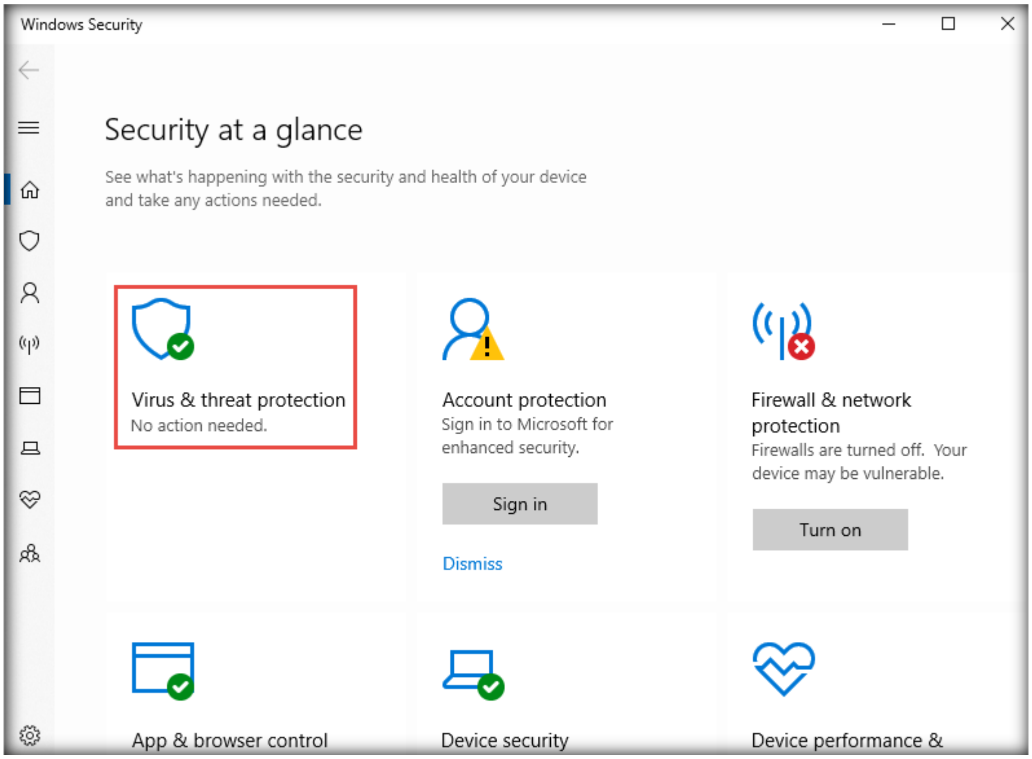

Settings
Windows Settings
Find a setting
System
Display, sound, notifications, power
Devices
Bluetooth, printers, mouse
Phone
Link your Android, iPhone
Network & Internet
WiFi, flight mode, VPN
Personalisation
Background, lock screen, colours
Apps
Uninstall, defaults, optional features
Accounts
Your accounts, email, sync, work, family
Time & Language
Speech, region, date
Gaming
Game bar, DVR, broadcasting, Game Mode
Ease of Access
Narrator, magnifier, high contrast
Cortana
Cortana language, permissions, notifications
Privacy
Location, camera
Update & Security
Windows Update, recovery, backup

23. In the **Settings** window, the **Update & Security** settings will be available in the left-hand pane. Then, click **Windows Security**. This page appears in the right-hand pane. Then, click the **Open Windows Security** button, as shown in the screenshot.


Settings
Home
Find a setting
Update & Security
Windows Update
Delivery Optimization
Windows Security
Backup
Troubleshoot
Recovery
Activation
Find my device
Windows Security
Open Windows Security
Protection areas
Virus & threat protection
No actions needed.
Account protection
Actions recommended.
Firewall & network protection
Actions needed.
App & browser control
No actions needed.
Device security
No actions needed.
Device performance & health
Reports on the health of your device.

Windows Security is your home to view and manage the security and health of your device.

24. In the **Windows Security** window, click **Virus & threat protection**.



Security at a glance

See what's happening with the security and health of your device and take any actions needed.

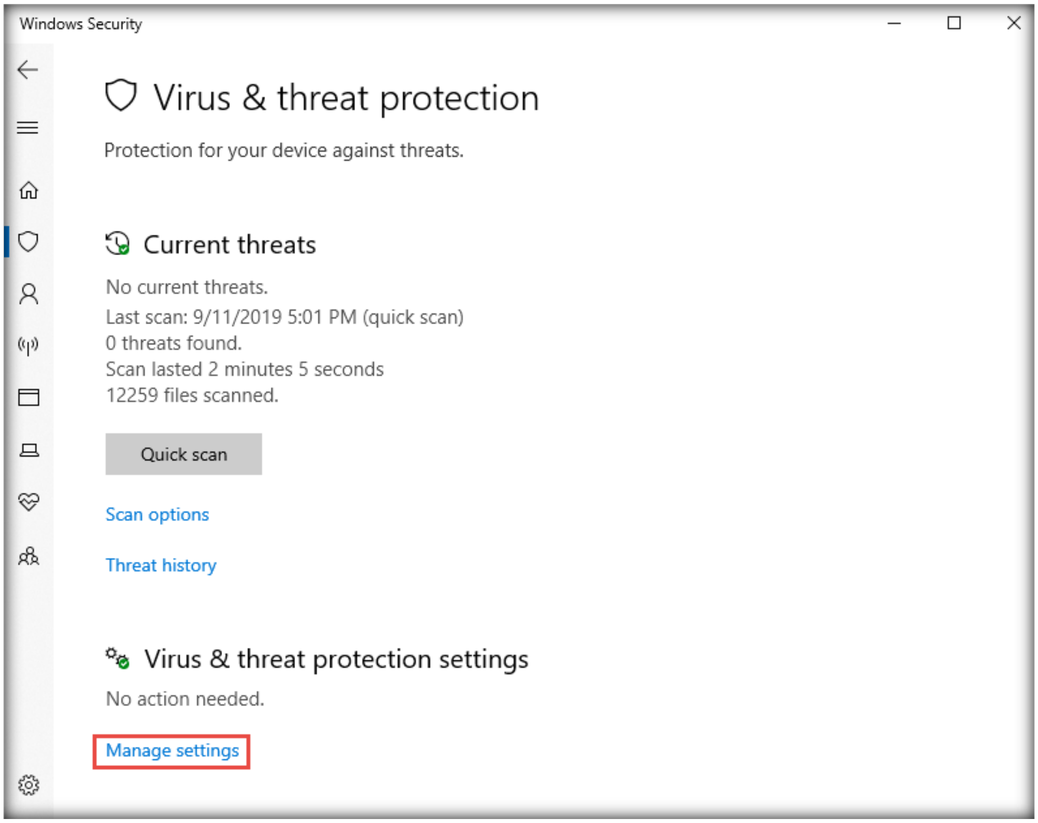
Virus & threat protection
No action needed.

Account protection
Sign in to Microsoft for enhanced security.

Firewall & network protection
Firewalls are turned off. Your device may be vulnerable.

Windows Security
Sign in
Dismiss
Turn on
App & browser control
Device security
Device performance &

25. On the **Virus & threat protection** page, click **Manage settings** under **Virus & threat protection settings**.



Virus & threat protection

Protection for your device against threats.

Current threats

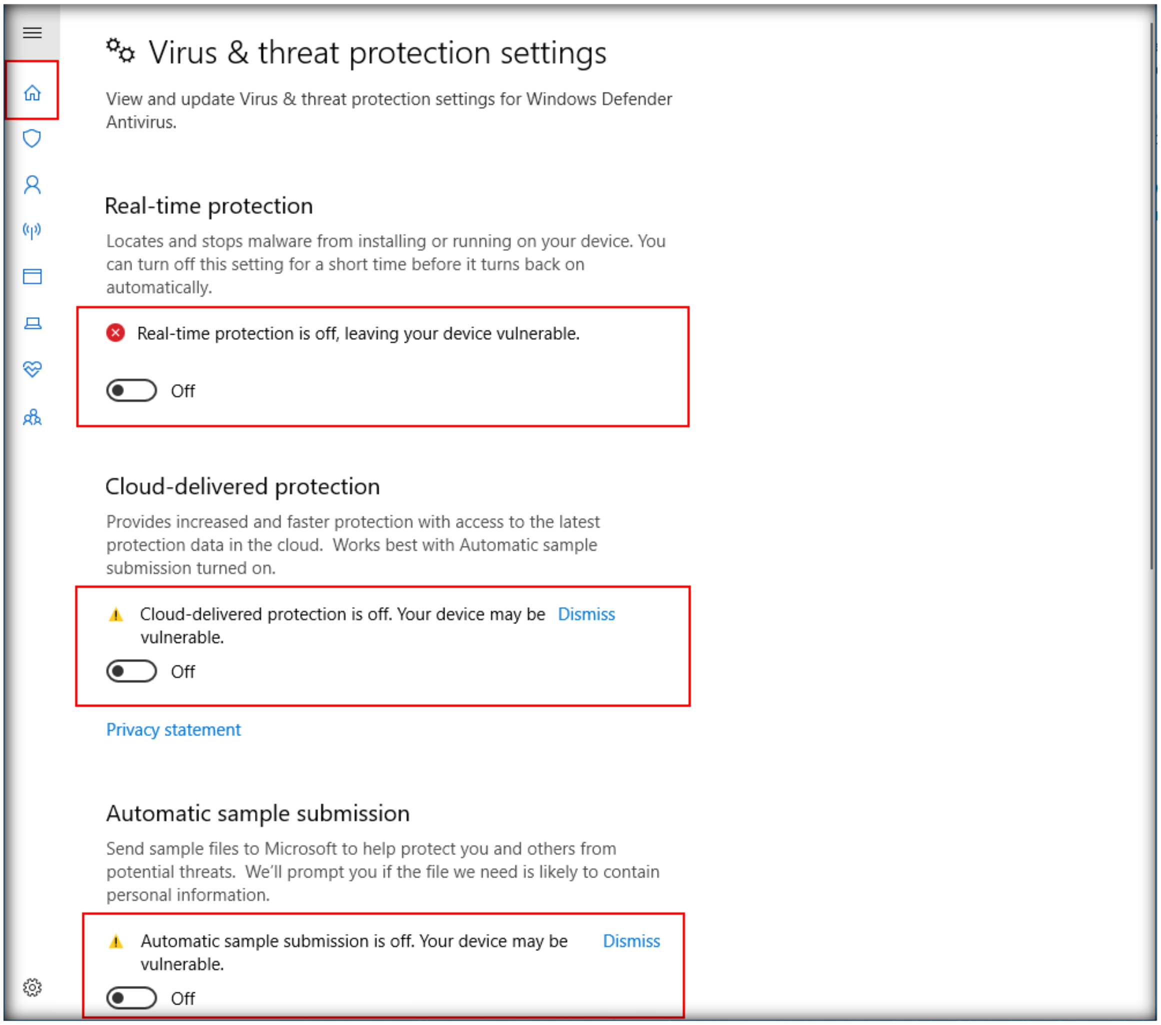
No current threats.
Last scan: 9/11/2019 5:01 PM (quick scan)
0 threats found.
Scan lasted 2 minutes 5 seconds
12259 files scanned.

Virus & threat protection settings

No action needed.

Windows Security
Quick scan
Scan options
Threat history
Manage settings

26. When the **Virus & threat protection settings** page appears, turn off **Real-time protection**, **Cloud-delivered protection**, and **Automatic sample submission**. If a **User Account Control** pop-up window appears, click **Yes**. After turning off the above-mentioned items, click the **Home** icon in the left menu bar.



Virus & threat protection settings

View and update Virus & threat protection settings for Windows Defender Antivirus.

Real-time protection

Locates and stops malware from installing or running on your device. You can turn off this setting for a short time before it turns back on automatically.

Real-time protection is off, leaving your device vulnerable.

Off

Cloud-delivered protection

Provides increased and faster protection with access to the latest protection data in the cloud. Works best with Automatic sample submission turned on.

Cloud-delivered protection is off. Your device may be vulnerable.

Off

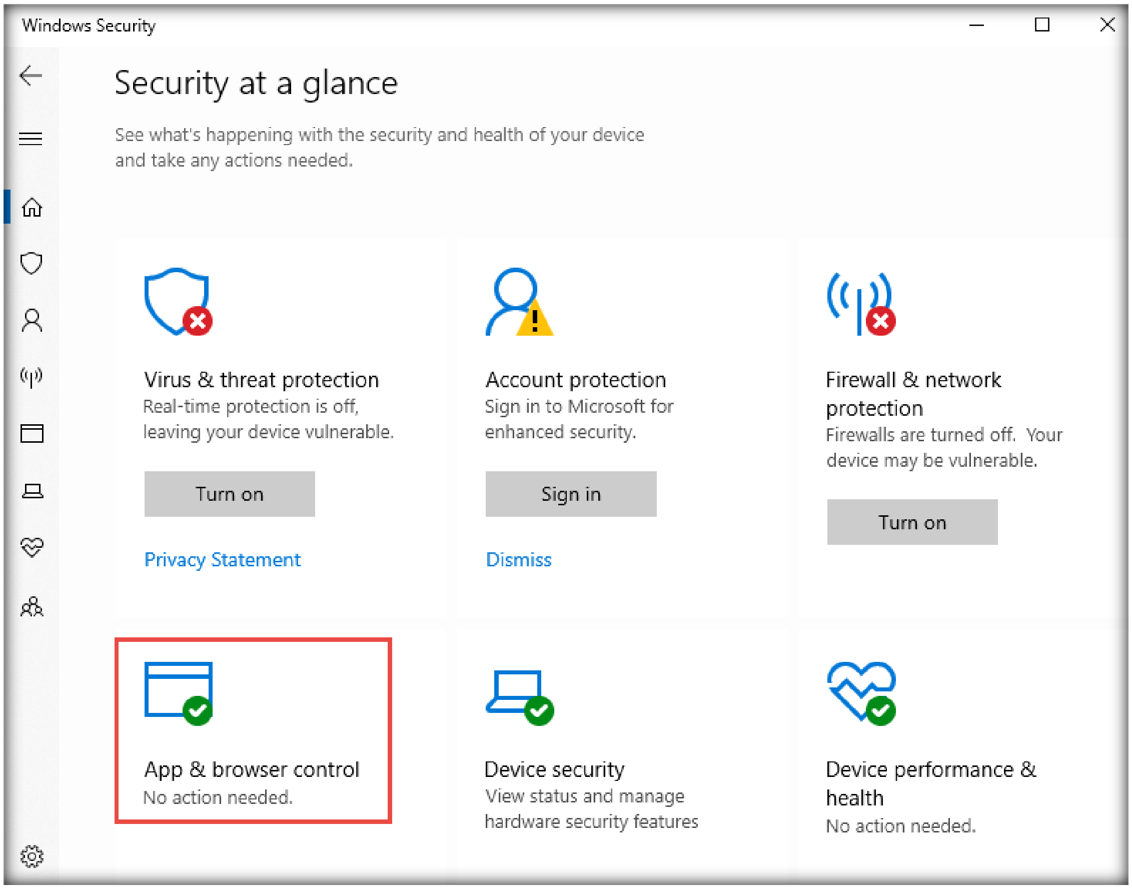
Automatic sample submission

Send sample files to Microsoft to help protect you and others from potential threats. We'll prompt you if the file we need is likely to contain personal information.

Automatic sample submission is off. Your device may be vulnerable.

Off

27. Next, click **App & browser control** in the **Windows Security** window.



Windows Security

Security at a glance

See what's happening with the security and health of your device and take any actions needed.

Virus & threat protection
Real-time protection is off, leaving your device vulnerable.

Account protection
Sign in to Microsoft for enhanced security.

Firewall & network protection
Firewalls are turned off. Your device may be vulnerable.

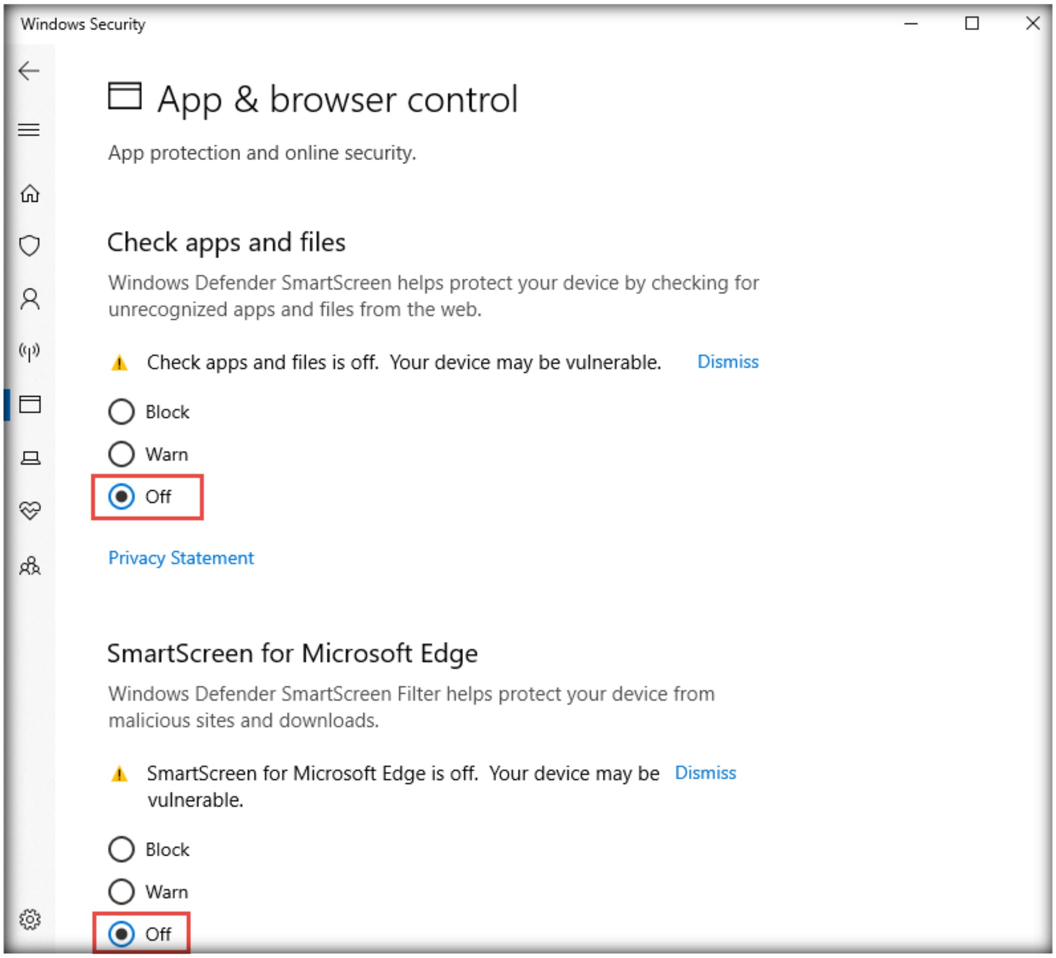
App & browser control
No action needed.

Device security
View status and manage hardware security features

Device performance & health
No action needed.

28. In the **App & browser control** page, select the **Off** radio button under **Check apps and files**, **SmartScreen for Microsoft Edge**, and **SmartScreen for Microsoft Store apps**. If a **User Account Control** pop-up window appears, click **Yes**.

    **Note**: If you are unable to turn off the **SmartScreen for Microsoft Edge** radio button, leave the setting for **SmartScreen for Microsoft Edge** radio button as it is, and continue with the setup.



App & browser control

App protection and online security.

Check apps and files

Windows Defender SmartScreen helps protect your device by checking for unrecognized apps and files from the web.

Check apps and files is off. Your device may be vulnerable. Dismiss

○ Block

○ Warn

● Off

SmartScreen for Microsoft Edge

Windows Defender SmartScreen Filter helps protect your device from malicious sites and downloads.

SmartScreen for Microsoft Edge is off. Your device may be vulnerable. Dismiss

○ Block

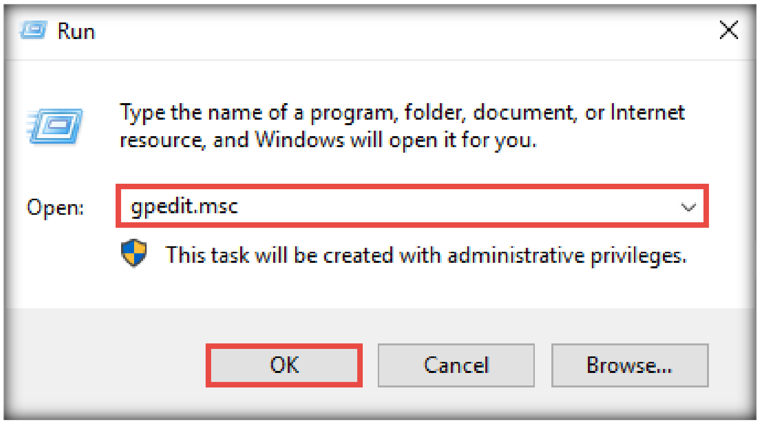
○ Warn

● Off

29. Close all windows.
30. Similarly, follow the above steps to turn off the Windows Defender Firewall on all Windows virtual machines (Windows Server 2019 and Windows Server 2016).

# CT#14: Configure Windows Components on all Windows Virtual Machines

1. Log in to the **Windows Server 2019** virtual machine, right-click on **Start**, and click **Run**.
2. The **Run** window appears; type **gpedit.msc** and click **OK**.

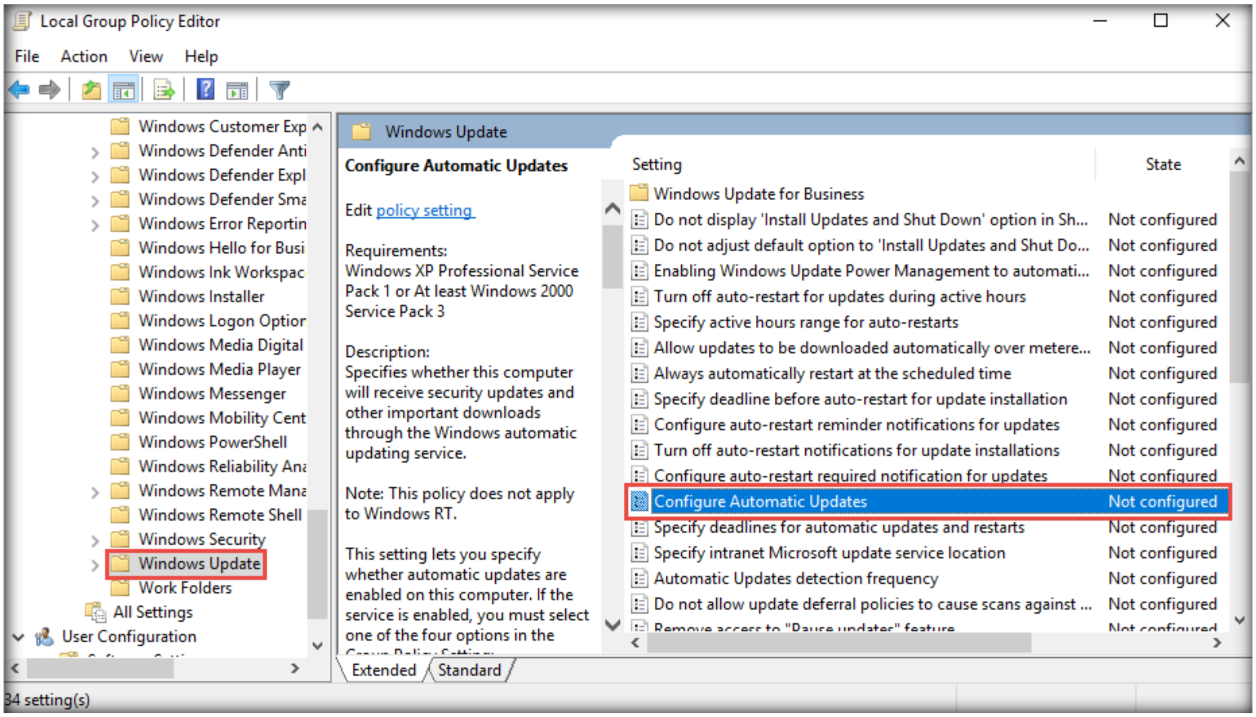

Run
OK
Cancel
Browse...

Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.

Open: gpedit.msc

This task will be created with administrative privileges.

3. The **Local Group Policy Editor** window appears; expand **Administrative Templates** under **Computer Configuration** in the left pane.
4. In **Administrative Templates**, expand **Windows Components**, scroll down, click **Windows Update** in the left pane, and double-click **Configure Automatic Updates** in the right-hand pane, as shown in the screenshot.


Local Group Policy Editor
File
Action
View
Help
Windows Customer Exp
Windows Defender Anti
Windows Defender Expl
Windows Defender Sma
Windows Error Reportin
Windows Hello for Busi
Windows Ink Workspac
Windows Installer
Windows Logon Optior
Windows Media Digital
Windows Media Player
Windows Messenger
Windows Mobility Cent
Windows PowerShell
Windows Reliability Ana
Windows Remote Mana
Windows Remote Shell
Windows Security
Windows Update
Work Folders
All Settings
User Configuration
Windows Update
Extended
Standard
34 setting(s)

**Configure Automatic Updates**

Edit policy setting

Requirements:
Windows XP Professional Service Pack 1 or At least Windows 2000 Service Pack 3

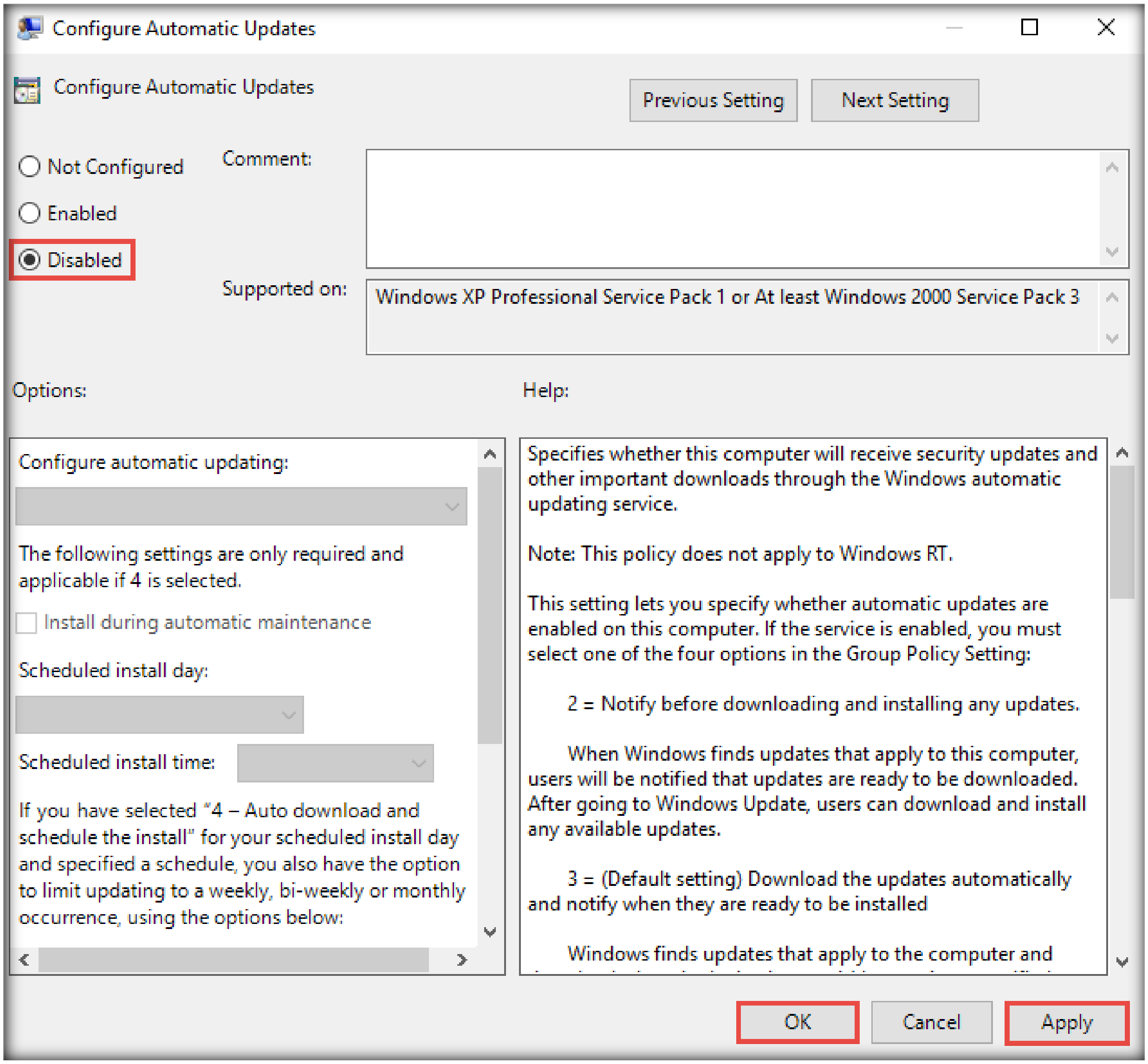
Description:
Specifies whether this computer will receive security updates and other important downloads through the Windows automatic updating service.

Note: This policy does not apply to Windows RT.

This setting lets you specify whether automatic updates are enabled on this computer. If the service is enabled, you must select one of the four options in the

| Setting | State |
|---|---|
| Windows Update for Business | |
| Do not display 'Install Updates and Shut Down' option in Sh... | Not configured |
| Do not adjust default option to 'Install Updates and Shut Do... | Not configured |
| Enabling Windows Update Power Management to automati... | Not configured |
| Turn off auto-restart for updates during active hours | Not configured |
| Specify active hours range for auto-restarts | Not configured |
| Allow updates to be downloaded automatically over metere... | Not configured |
| Always automatically restart at the scheduled time | Not configured |
| Specify deadline before auto-restart for update installation | Not configured |
| Configure auto-restart reminder notifications for updates | Not configured |
| Turn off auto-restart notifications for update installations | Not configured |
| Configure auto-restart required notification for updates | Not configured |
| Configure Automatic Updates | Not configured |
| Specify deadlines for automatic updates and restarts | Not configured |
| Specify intranet Microsoft update service location | Not configured |
| Automatic Updates detection frequency | Not configured |
| Do not allow update deferral policies to cause scans against ... | Not configured |
| Remove access to "Pause updates" feature | Not configured |

5. The **Configure Automatic Updates** window appears; select the **Disabled** radio button and click **Apply** and **OK**.



Configure Automatic Updates

○ Not Configured

○ Enabled

● Disabled

Comment:

Supported on: Windows XP Professional Service Pack 1 or At least Windows 2000 Service Pack 3

Options:

Configure automatic updating:

The following settings are only required and applicable if 4 is selected.

☐ Install during automatic maintenance

Scheduled install day:

Scheduled install time:

If you have selected "4 – Auto download and schedule the install" for your scheduled install day and specified a schedule, you also have the option to limit updating to a weekly, bi-weekly or monthly occurrence, using the options below:

Help:

Specifies whether this computer will receive security updates and other important downloads through the Windows automatic updating service.

Note: This policy does not apply to Windows RT.

This setting lets you specify whether automatic updates are enabled on this computer. If the service is enabled, you must select one of the four options in the Group Policy Setting:

2 = Notify before downloading and installing any updates.

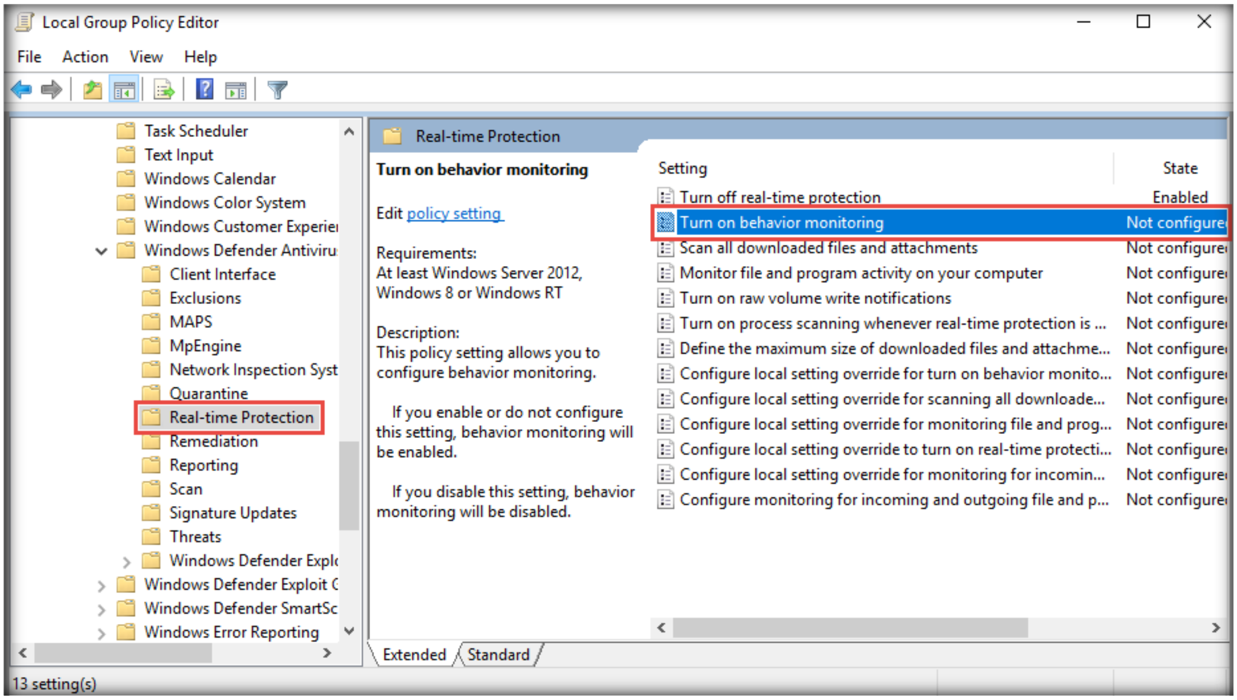
When Windows finds updates that apply to this computer, users will be notified that updates are ready to be downloaded. After going to Windows Update, users can download and install any available updates.

3 = (Default setting) Download the updates automatically and notify when they are ready to be installed

Windows finds updates that apply to the computer and

6. In the left-hand pane, navigate to **Local Computer Policy** → **Computer Configuration** → **Administrative Templates** → **Windows Components** → **Windows Defender Antivirus** → **Real-time Protection**.

7. Double-click the **Turn on behavior monitoring** setting to configure its settings.


Local Group Policy Editor
File Action View Help
Task Scheduler
Text Input
Windows Calendar
Windows Color System
Windows Customer Experie
Windows Defender Antiviru
Client Interface
Exclusions
MAPS
MpEngine
Network Inspection Syst
Quarantine
Real-time Protection
Remediation
Reporting
Scan
Signature Updates
Threats
Windows Defender Expl
Windows Defender Exploit G
Windows Defender SmartSc
Windows Error Reporting
Extended
Standard
13 setting(s)

Real-time Protection

**Turn on behavior monitoring**

Edit policy setting

Requirements:
At least Windows Server 2012, Windows 8 or Windows RT

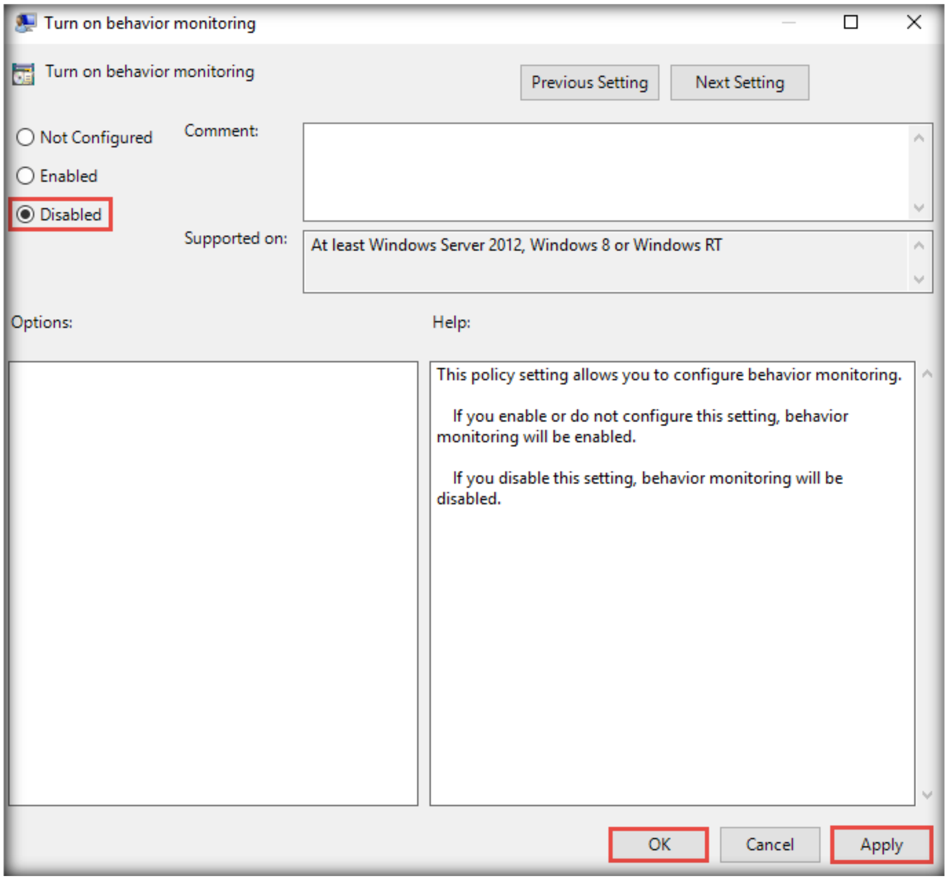
Description:
This policy setting allows you to configure behavior monitoring.

If you enable or do not configure this setting, behavior monitoring will be enabled.

If you disable this setting, behavior monitoring will be disabled.

| Setting | State |
|---|---|
| Turn off real-time protection | Enabled |
| Turn on behavior monitoring | Not configure |
| Scan all downloaded files and attachments | Not configure |
| Monitor file and program activity on your computer | Not configure |
| Turn on raw volume write notifications | Not configure |
| Turn on process scanning whenever real-time protection is ... | Not configure |
| Define the maximum size of downloaded files and attachme... | Not configure |
| Configure local setting override for turn on behavior monito... | Not configure |
| Configure local setting override for scanning all downloade... | Not configure |
| Configure local setting override for monitoring file and prog... | Not configure |
| Configure local setting override to turn on real-time protecti... | Not configure |
| Configure local setting override for monitoring for incomin... | Not configure |
| Configure monitoring for incoming and outgoing file and p... | Not configure |

8. The **Turn on behavior monitoring** window appears. Select the **Disabled** radio button and click **Apply** and **OK**.


Turn on behavior monitoring
Turn on behavior monitoring
Previous Setting
Next Setting
Comment:
Options:
Help:
OK
Cancel
Apply

○ Not Configured
○ Enabled
● Disabled

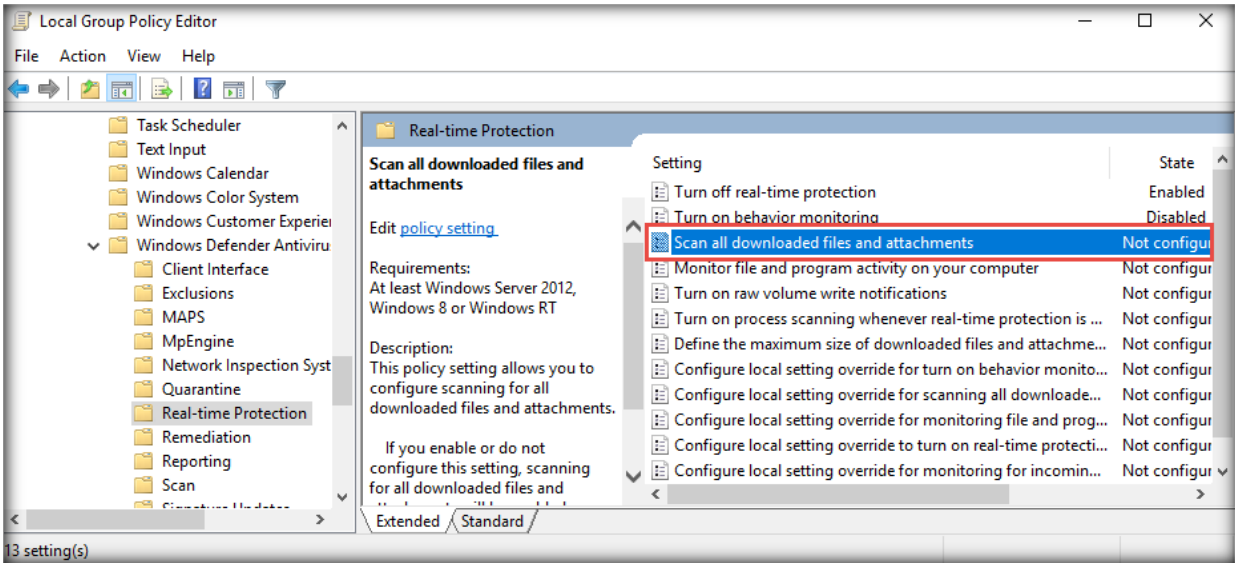
Supported on: At least Windows Server 2012, Windows 8 or Windows RT

This policy setting allows you to configure behavior monitoring.

If you enable or do not configure this setting, behavior monitoring will be enabled.

If you disable this setting, behavior monitoring will be disabled.

9. Double-click the **Scan all downloaded files and attachments** setting, as shown in the screenshot.


Local Group Policy Editor
File
Action
View
Help
Task Scheduler
Text Input
Windows Calendar
Windows Color System
Windows Customer Experie
Windows Defender Antiviru
Client Interface
Exclusions
MAPS
MpEngine
Network Inspection Syst
Quarantine
Real-time Protection
Remediation
Reporting
Scan
Real-time Protection
Extended
Standard
13 setting(s)

**Scan all downloaded files and attachments**

Edit policy setting

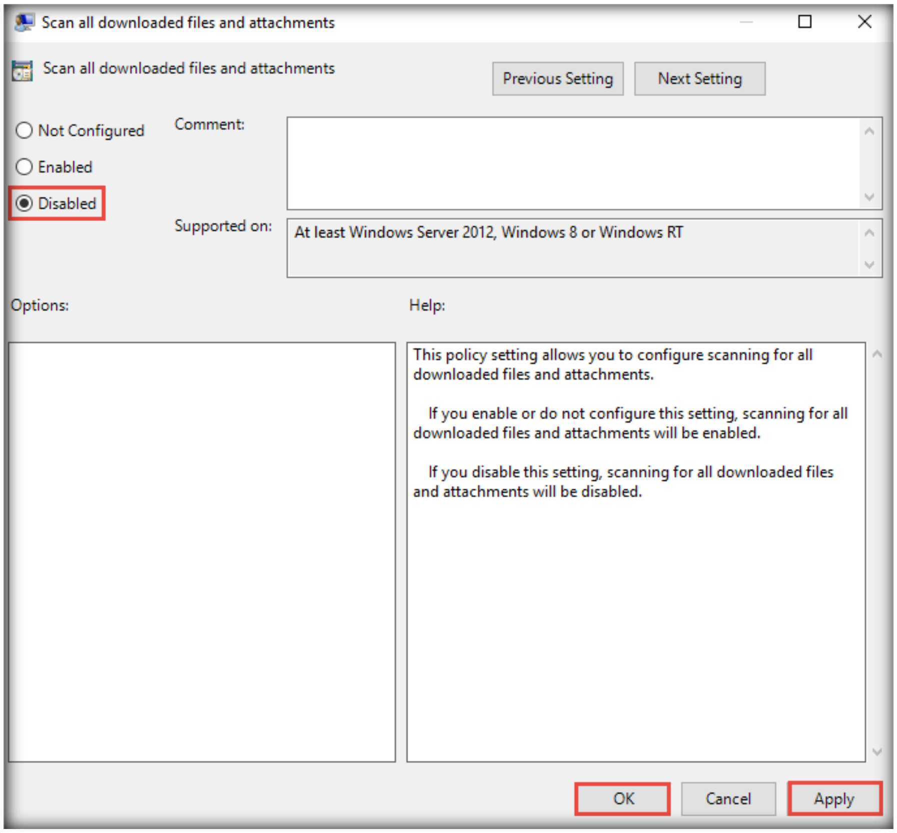
Requirements:
At least Windows Server 2012, Windows 8 or Windows RT

Description:
This policy setting allows you to configure scanning for all downloaded files and attachments.

If you enable or do not configure this setting, scanning for all downloaded files and

| Setting | State |
|---|---|
| Turn off real-time protection | Enabled |
| Turn on behavior monitoring | Disabled |
| Scan all downloaded files and attachments | Not configu |
| Monitor file and program activity on your computer | Not configu |
| Turn on raw volume write notifications | Not configu |
| Turn on process scanning whenever real-time protection is ... | Not configu |
| Define the maximum size of downloaded files and attachme... | Not configu |
| Configure local setting override for turn on behavior monito... | Not configu |
| Configure local setting override for scanning all downloade... | Not configu |
| Configure local setting override for monitoring file and prog... | Not configu |
| Configure local setting override to turn on real-time protecti... | Not configu |
| Configure local setting override for monitoring for incomin... | Not configu |

10. The **Scan all downloaded files and attachments** window appears. Select the **Disabled** radio button and click **Apply** and **OK**.


Scan all downloaded files and attachments
Scan all downloaded files and attachments
Previous Setting
Next Setting
Comment:
Options:
Help:
OK
Cancel
Apply

○ Not Configured
○ Enabled
● Disabled

Supported on: At least Windows Server 2012, Windows 8 or Windows RT

This policy setting allows you to configure scanning for all downloaded files and attachments.

If you enable or do not configure this setting, scanning for all downloaded files and attachments will be enabled.

If you disable this setting, scanning for all downloaded files and attachments will be disabled.

11. Similarly, follow the above steps to configure Windows Components on the **Windows Server 2016** and **Windows 10** virtual machines.

[Back to Configuration Task Outline]

## CT#15: Install WinRAR on the Windows 10 Virtual Machine

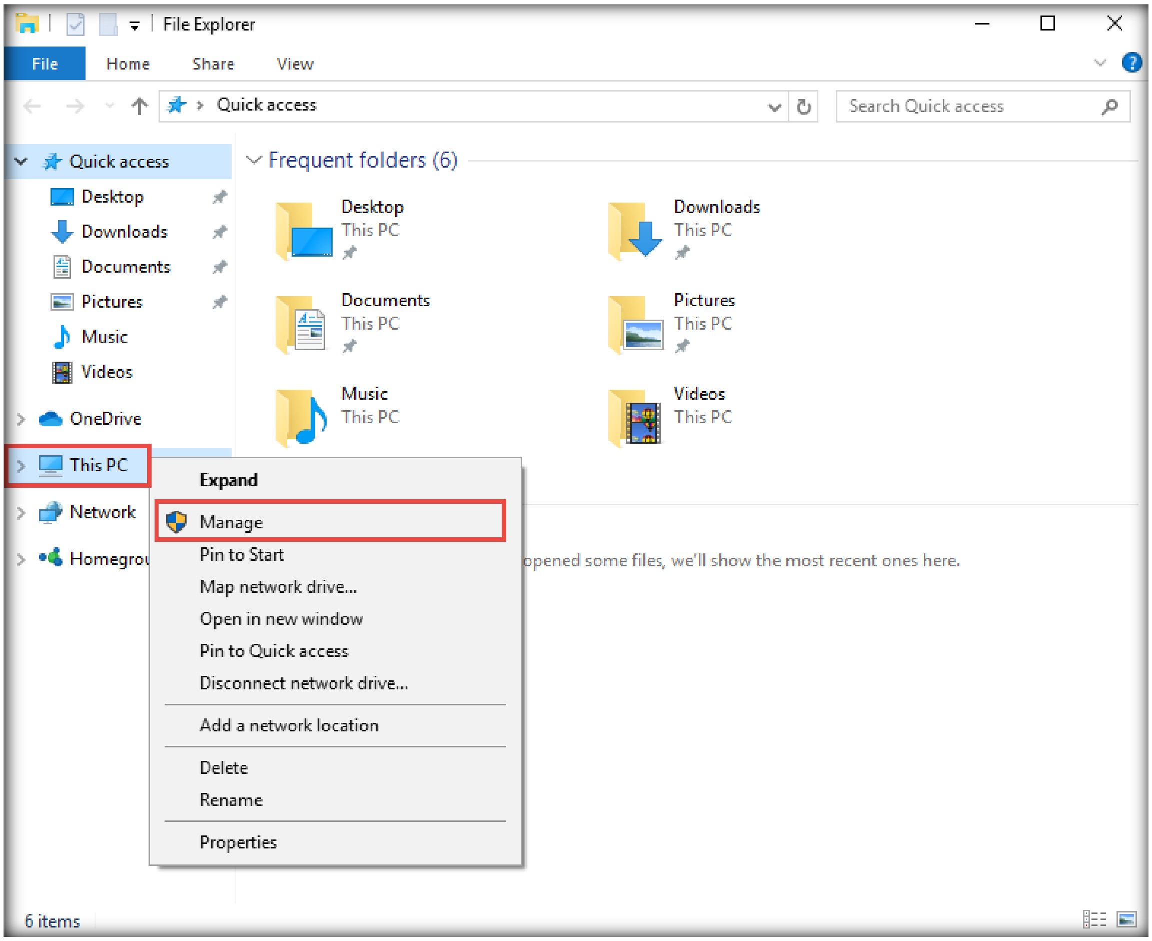
1. Log in to the **Windows 10** virtual machine with the credentials **Admin** and **Pa$$w0rd**.
2. Download the latest version of **WinRAR** from the WinRAR official website (**https://www.rarlab.com/download.htm**).

   **Note**: Download the 64-bit version of WinRAR.
3. Double click on the **.exe** setup file to begin the installation. If a **User Account Control** pop-up window appears, click **Yes**.
4. The **WinRAR** setup window appears; click **Install**.
5. Complete the installation by choosing the default settings throughout the installation process.
6. After completing the installation, the **installation location of WinRAR files** window opens automatically; close the window.

[Back to Configuration Task Outline]

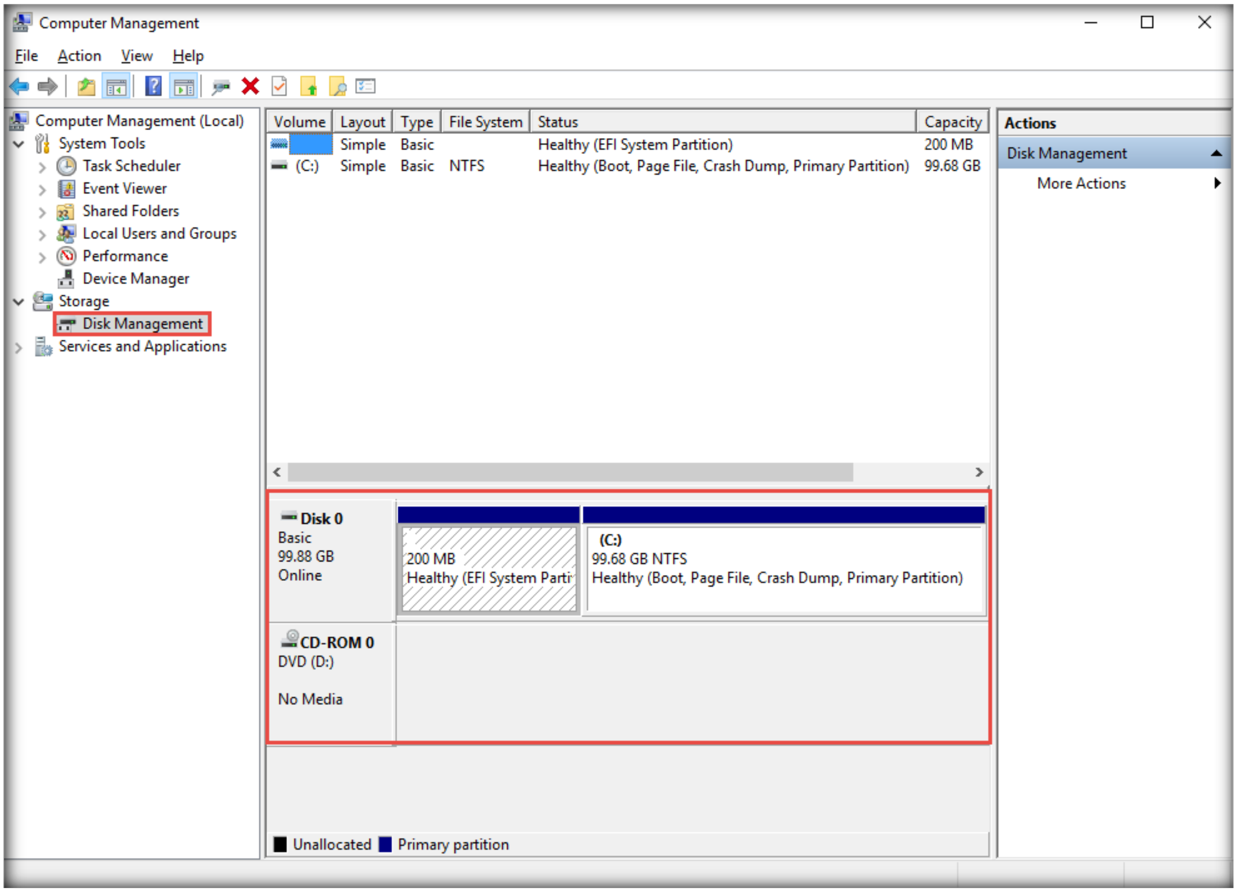
# CT#16: Create a Partition in the Windows 10 Virtual Machine

1. Click the **Start** button in the bottom-left corner and click **File Explorer** from the context menu.
2. In the **File Explorer** window, right-click **This PC** in the left-hand pane and click **Manage**.


File Explorer
File
Home
Share
View
Quick access
Search Quick access
Quick access
Desktop
Downloads
Documents
Pictures
Music
Videos
OneDrive
This PC
Network
Homegrou
Frequent folders (6)
Desktop
This PC
Downloads
This PC
Documents
This PC
Pictures
This PC
Music
This PC
Videos
This PC
Expand
Manage
Pin to Start
Map network drive...
Open in new window
Pin to Quick access
Disconnect network drive...
Add a network location
Delete
Rename
Properties
opened some files, we'll show the most recent ones here.
6 items

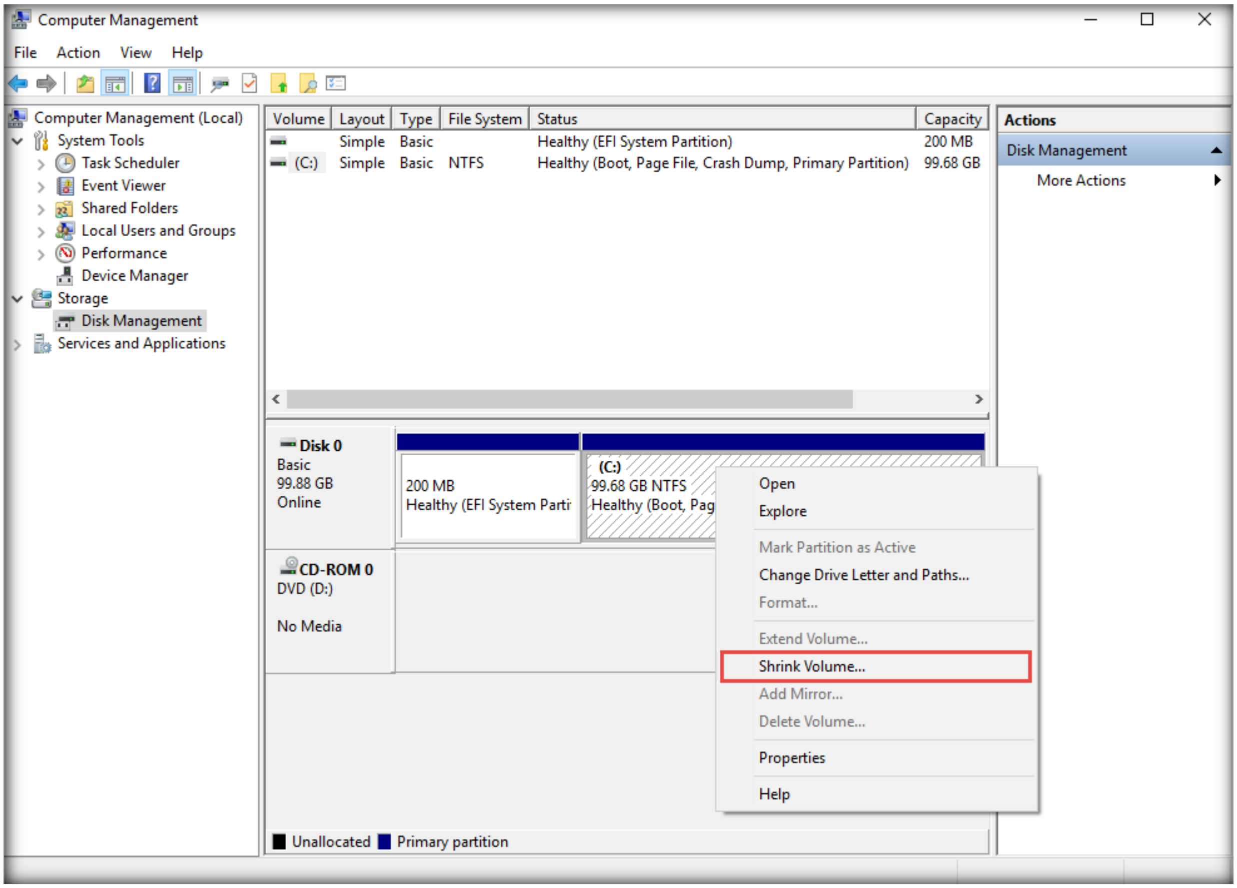
3. The **Computer Management** window appears. Navigate to **Computer Management (Local)** → **Storage** → **Disk Management** from the left-hand pane. This will display the current disk partition in the middle-pane, as shown in the screenshot.

   **Note**: While creating Windows 10 virtual machine, we allocate 100 GB disk space. Here, we will create partition of C: 60 GB and E: 40 GB.


Computer Management
File
Action
View
Help
Computer Management (Local)
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Disk Management
Services and Applications
Actions
Disk Management
More Actions
Disk 0
Basic
99.88 GB
Online
200 MB
Healthy (EFI System Parti
(C:)
99.68 GB NTFS
Healthy (Boot, Page File, Crash Dump, Primary Partition)
CD-ROM 0
DVD (D:)
No Media
■ Unallocated
■ Primary partition

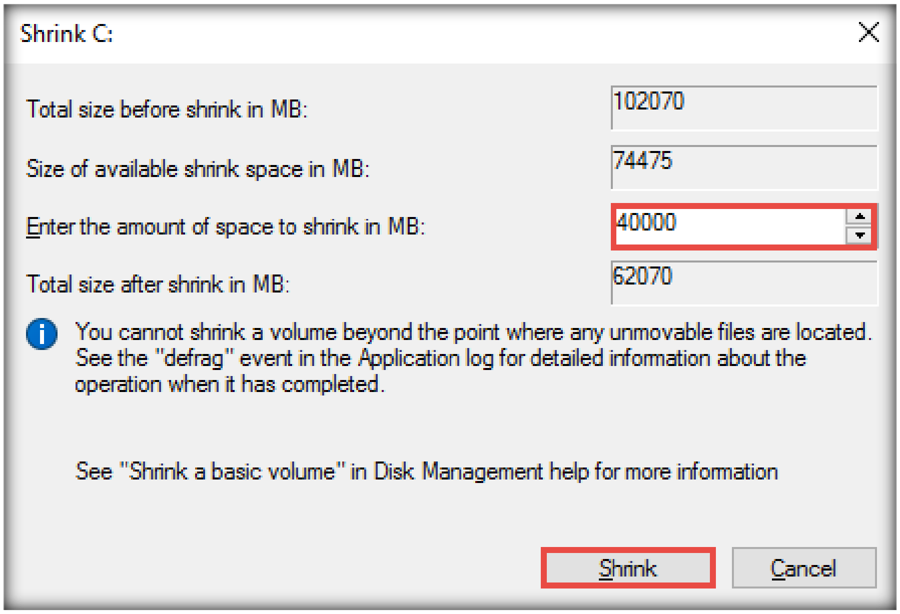
| Volume | Layout | Type | File System | Status | Capacity |
|---|---|---|---|---|---|
| | Simple | Basic | | Healthy (EFI System Partition) | 200 MB |
| (C:) | Simple | Basic | NTFS | Healthy (Boot, Page File, Crash Dump, Primary Partition) | 99.68 GB |

4. Select the drive from the middle-pane (Here, **C:**), right-click the selected drive and click **Shrink Volume...**


Computer Management
File
Action
View
Help
Computer Management (Local)
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Disk Management
Services and Applications
Actions
Disk Management
More Actions
Disk 0
Basic
99.88 GB
Online
200 MB
Healthy (EFI System Parti
(C:)
99.68 GB NTFS
Healthy (Boot, Pag
CD-ROM 0
DVD (D:)
No Media
Open
Explore
Mark Partition as Active
Change Drive Letter and Paths...
Format...
Extend Volume...
Shrink Volume...
Add Mirror...
Delete Volume...
Properties
Help
■ Unallocated
■ Primary partition

| Volume | Layout | Type | File System | Status | Capacity |
|---|---|---|---|---|---|
| | Simple | Basic | | Healthy (EFI System Partition) | 200 MB |
| (C:) | Simple | Basic | NTFS | Healthy (Boot, Page File, Crash Dump, Primary Partition) | 99.68 GB |

5. **Shrink C:** window appears showing available shrink space. Enter **40000** (i.e., 40 GB) in the **Enter the amount of space to shrink in MB:** field and click **Shrink**


Shrink C:
Shrink
Cancel

Total size before shrink in MB: 102070

Size of available shrink space in MB: 74475

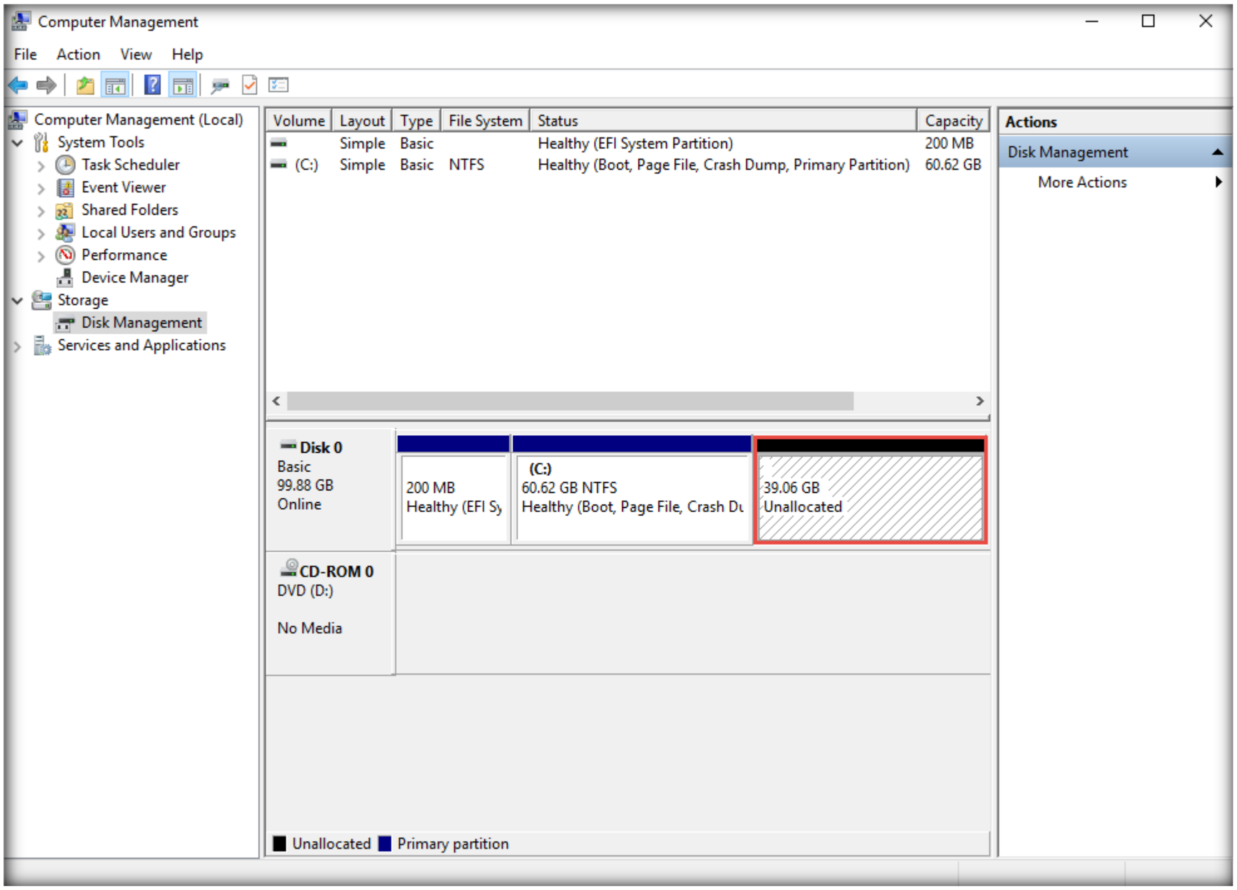
Enter the amount of space to shrink in MB: 40000

Total size after shrink in MB: 62070

You cannot shrink a volume beyond the point where any unmovable files are located. See the "defrag" event in the Application log for detailed information about the operation when it has completed.

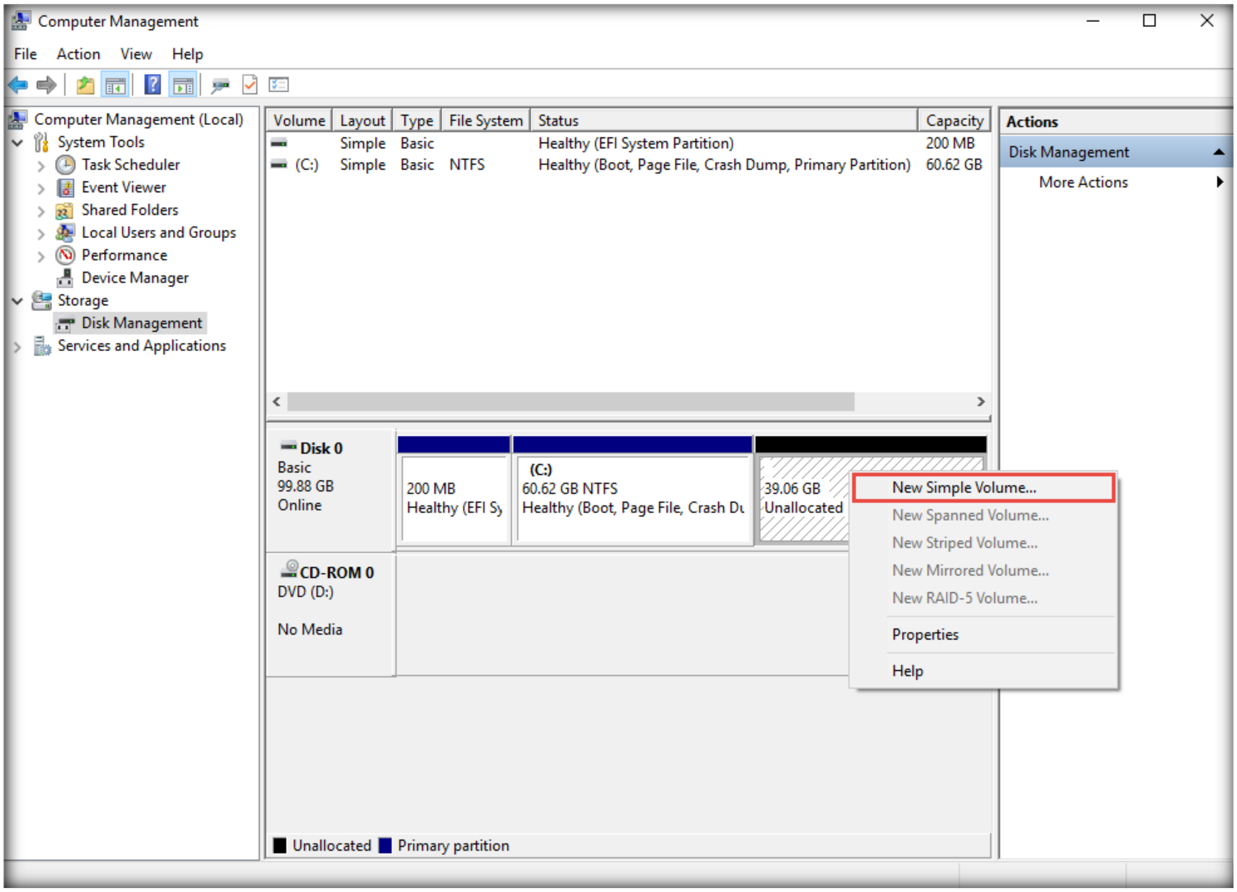
See "Shrink a basic volume" in Disk Management help for more information

6. **Computer Management** window will display the newly created unallocated disk partition in the middle-pane as shown in the screenshot


Computer Management
File
Action
View
Help
Computer Management (Local)
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Disk Management
Services and Applications
Actions
Disk Management
More Actions
Disk 0
Basic
99.88 GB
Online
200 MB
Healthy (EFI Sy
(C:)
60.62 GB NTFS
Healthy (Boot, Page File, Crash Du
39.06 GB
Unallocated
CD-ROM 0
DVD (D:)
No Media
Unallocated
Primary partition

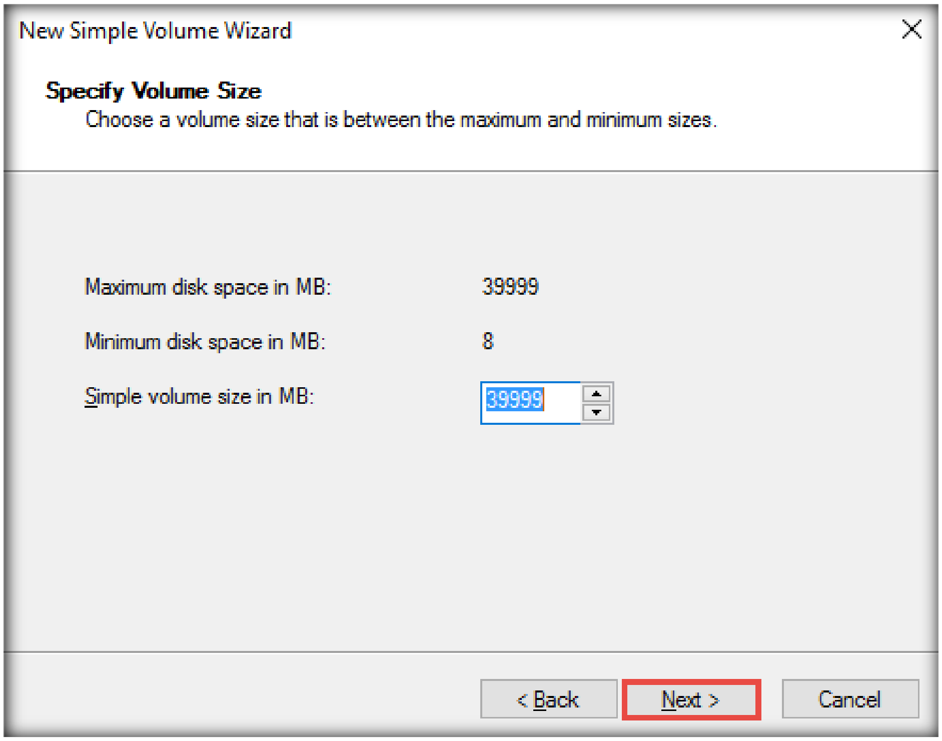
| Volume | Layout | Type | File System | Status | Capacity |
|---|---|---|---|---|---|
| | Simple | Basic | | Healthy (EFI System Partition) | 200 MB |
| (C:) | Simple | Basic | NTFS | Healthy (Boot, Page File, Crash Dump, Primary Partition) | 60.62 GB |

7. Select the **Unallocated** drive from the middle-pane, right-click the selected drive and click **New Simple Volume...**


Computer Management
File Action View Help
Computer Management (Local)
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Disk Management
Services and Applications
Volume Layout Type File System Status Capacity
Simple Basic Healthy (EFI System Partition) 200 MB
(C:) Simple Basic NTFS Healthy (Boot, Page File, Crash Dump, Primary Partition) 60.62 GB
Actions
Disk Management
More Actions
Disk 0
Basic
99.88 GB
Online
200 MB
Healthy (EFI Sy
(C:)
60.62 GB NTFS
Healthy (Boot, Page File, Crash Du
39.06 GB
Unallocated
New Simple Volume...
New Spanned Volume...
New Striped Volume...
New Mirrored Volume...
New RAID-5 Volume...
Properties
Help
CD-ROM 0
DVD (D:)
No Media
Unallocated
Primary partition

8. **New Simple Volume Wizard** window appears, click **Next**.

9. In the **Specify Volume Size** wizard, leave the default settings and click **Next**.



New Simple Volume Wizard

**Specify Volume Size**

Choose a volume size that is between the maximum and minimum sizes.

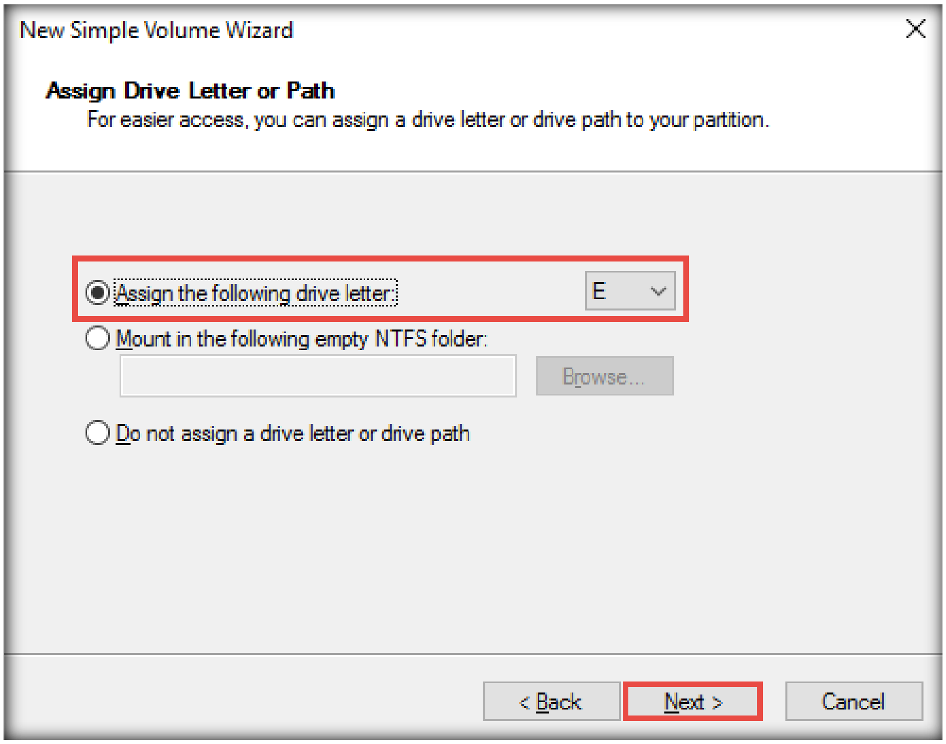
Maximum disk space in MB: 39999

Minimum disk space in MB: 8

Simple volume size in MB: 39999

10. In the **Assign Drive Letter or Path** wizard, the **E** letter will be selected in the **Assign the following drive letter** field by default; click **Next**.

**Note**: If other letter is selected in the **Assign the following drive letter** field, click on the drop-down menu and select **E** as the letter.



New Simple Volume Wizard

**Assign Drive Letter or Path**

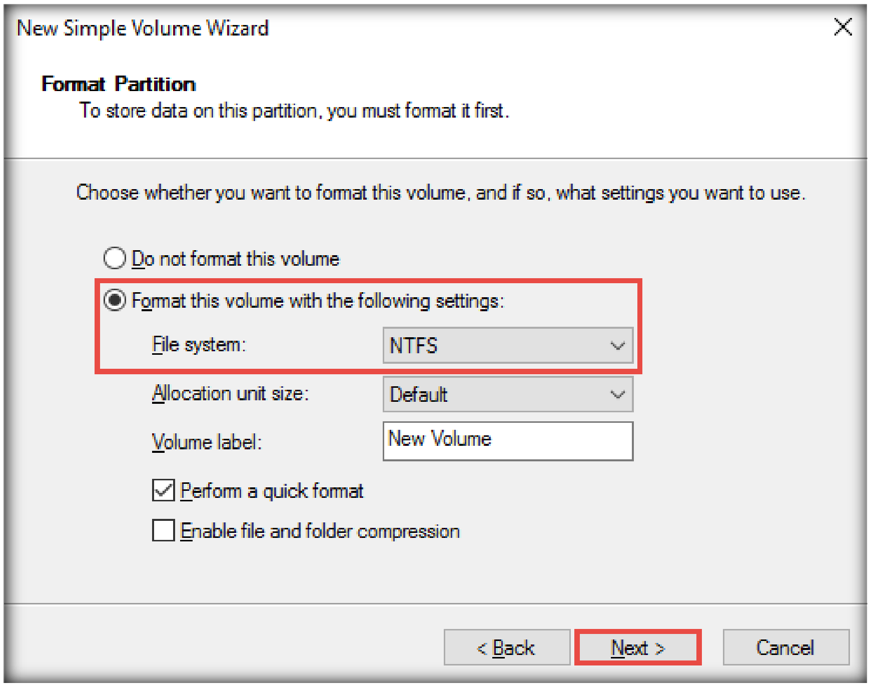
For easier access, you can assign a drive letter or drive path to your partition.

● Assign the following drive letter: E

○ Mount in the following empty NTFS folder:

○ Do not assign a drive letter or drive path

11. In the **Format Partition** wizard, **NTFS** is the file system selected to format the volume by default; click **Next**.



New Simple Volume Wizard

**Format Partition**

To store data on this partition, you must format it first.

Choose whether you want to format this volume, and if so, what settings you want to use.

○ Do not format this volume

● Format this volume with the following settings:

File system: NTFS

Allocation unit size: Default

Volume label: New Volume

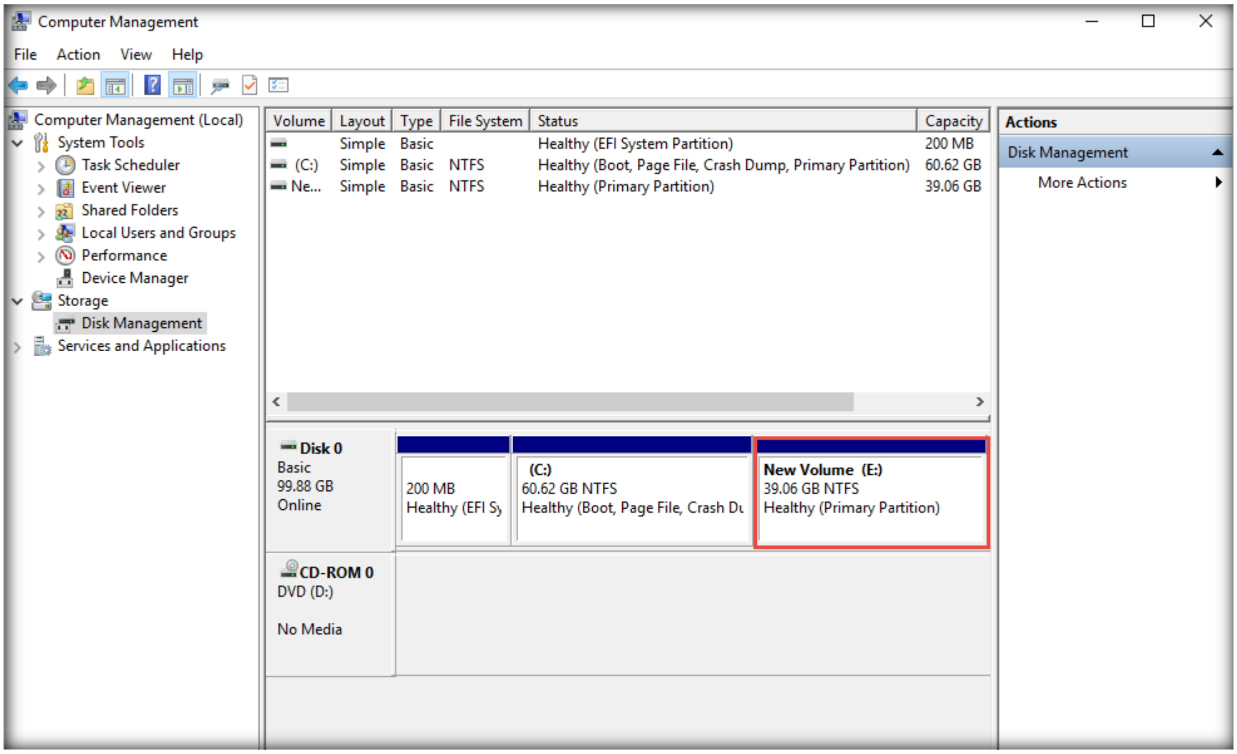
☑ Perform a quick format

☐ Enable file and folder compression

< Back
Next >
Cancel

12. In the next wizard, click **Finish**

13. **Computer Management** window will display the newly created disk partition in the middle-pane, as shown in the screenshot.



Computer Management
File
Action
View
Help
Computer Management (Local)
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Disk Management
Services and Applications
Actions
Disk Management
More Actions

| Volume | Layout | Type | File System | Status | Capacity |
|---|---|---|---|---|---|
| | Simple | Basic | | Healthy (EFI System Partition) | 200 MB |
| (C:) | Simple | Basic | NTFS | Healthy (Boot, Page File, Crash Dump, Primary Partition) | 60.62 GB |
| Ne... | Simple | Basic | NTFS | Healthy (Primary Partition) | 39.06 GB |

**Disk 0**
Basic
99.88 GB
Online

200 MB
Healthy (EFI Sy

(C:)
60.62 GB NTFS
Healthy (Boot, Page File, Crash Du

**New Volume (E:)**
39.06 GB NTFS
Healthy (Primary Partition)

**CD-ROM 0**
DVD (D:)

No Media

14. Close all windows and restart the **Windows 10** virtual machine.

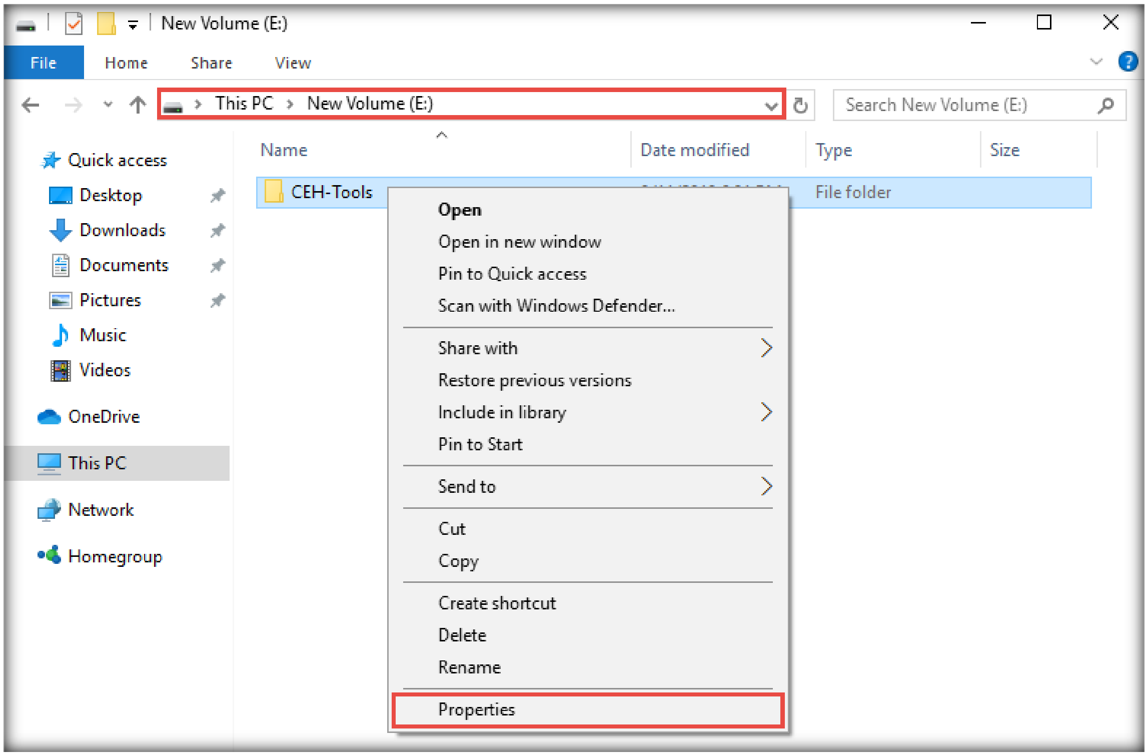
## CT#17: Download CEH Tools on the Windows 10 Virtual Machine

1. Log in to the **Windows 10** virtual machine with the credentials **Admin** and **Pa$$w0rd**
2. Create a folder on drive **E:** named **CEH-Tools**.
3. Log in to your **Aspen** account (You will see your course listed under **My Courses**) → Click the **TRAINING** button under the course to access the e-Courseware, Lab Manuals, and Tools in the **Training** area → Click the **Download Tools** tab from the left-hand pane.
4. Click the module names in the right-hand pane (Except CEHv11 ISO.zip) and download all the **CEH Tools** files to the **E:\CEH-Tools** folder.
5. Right-click the .zip files in the **E:\CEH-Tools** folder and select the **Extract Here** option.

[Back to Configuration Task Outline]

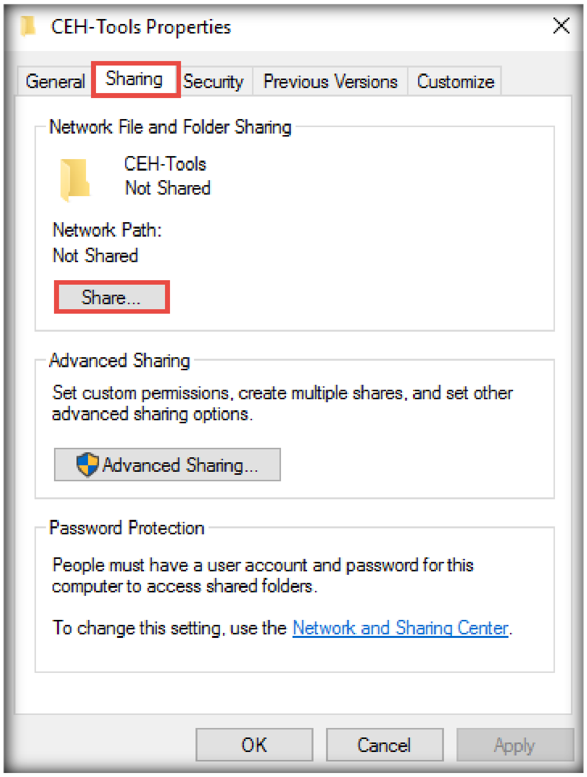
## CT#18: Share and Map the CEH-Tools Folder to the Windows Virtual Machines

1. Log in to the **Windows 10** virtual machine with the credentials **Admin** and **Pa$$w0rd**.
2. Open the **File Explorer** window, navigate to the **E:** drive, right-click on the **CEH-Tools** folder, and select **Properties** from the context menu.


New Volume (E:)
File
Home
Share
View
This PC › New Volume (E:)
Search New Volume (E:)
Quick access
Desktop
Downloads
Documents
Pictures
Music
Videos
OneDrive
This PC
Network
Homegroup
Name
Date modified
Type
Size
CEH-Tools
File folder
Open
Open in new window
Pin to Quick access
Scan with Windows Defender...
Share with
Restore previous versions
Include in library
Pin to Start
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties

3. Select the **Sharing** tab from the **CEH-Tools Properties** window to modify and display the current shared folder settings.

4. Click the **Share...** button to access the **File Sharing** option.


CEH-Tools Properties
General
Sharing
Security
Previous Versions
Customize
Network File and Folder Sharing
Share...
Advanced Sharing
Advanced Sharing...
Password Protection
OK
Cancel
Apply

CEH-Tools
Not Shared

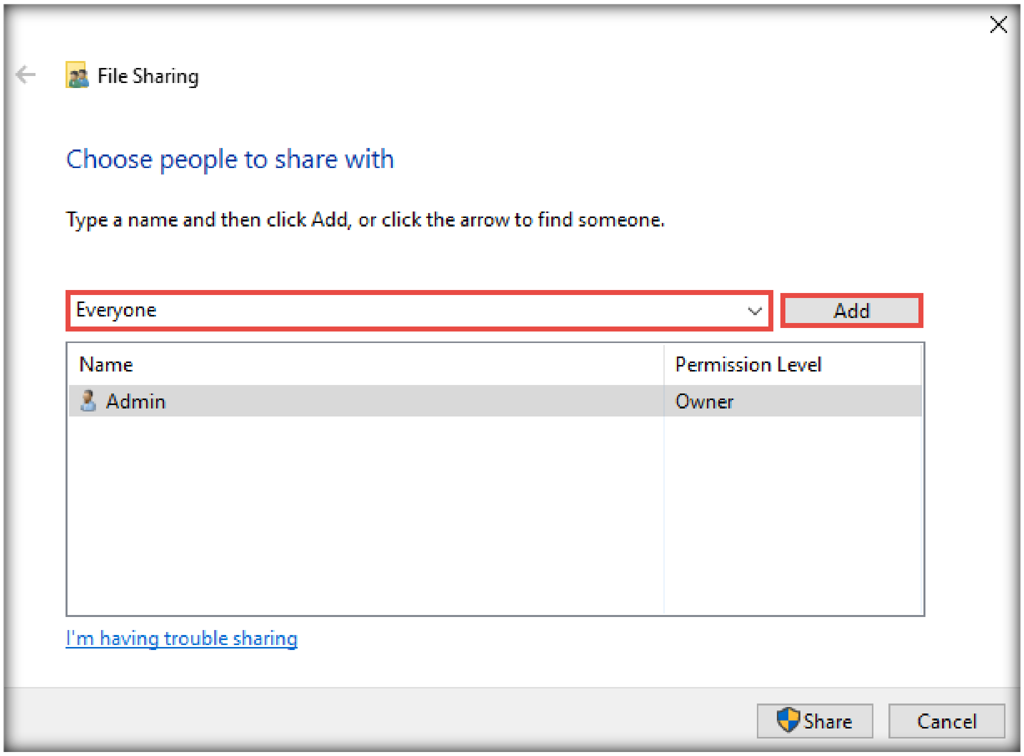
Network Path:
Not Shared

Set custom permissions, create multiple shares, and set other advanced sharing options.

People must have a user account and password for this computer to access shared folders.

To change this setting, use the Network and Sharing Center.

5. In the **File Sharing** wizard, select **Everyone** from the drop-down list and click **Add**.


File Sharing
Add
I'm having trouble sharing
Share
Cancel

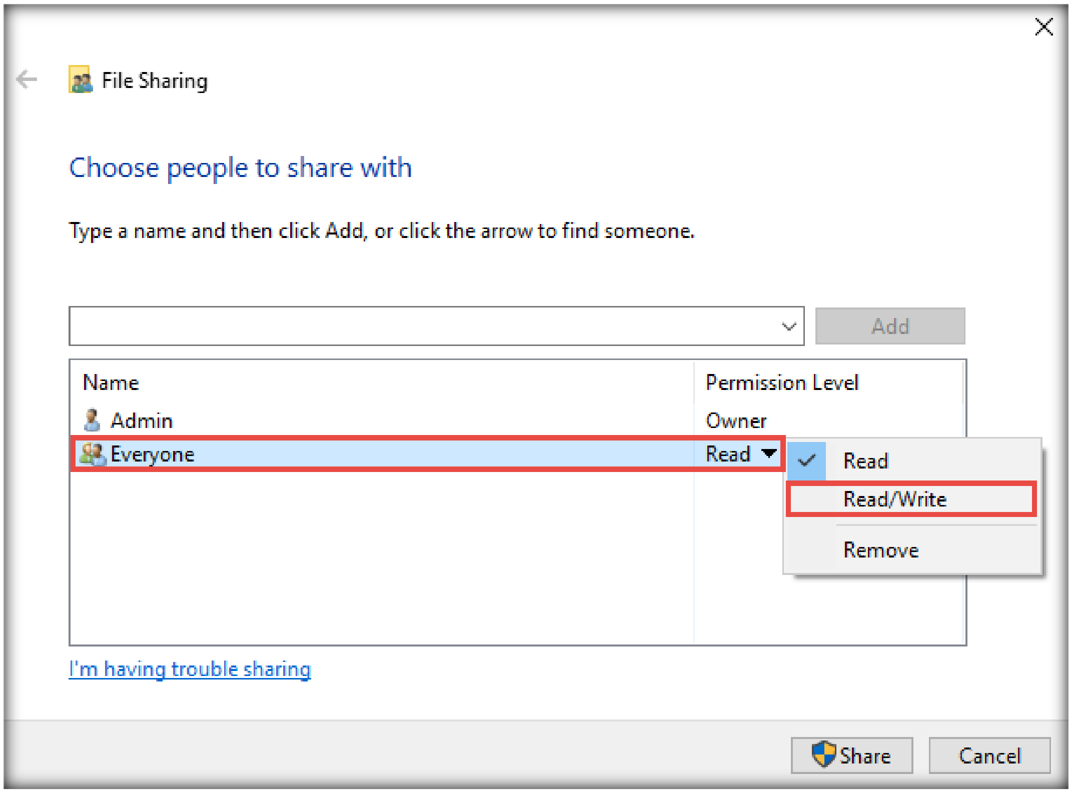
Choose people to share with

Type a name and then click Add, or click the arrow to find someone.

Everyone

| Name | Permission Level |
|---|---|
| Admin | Owner |

6. For the newly added users (**Everyone**), click the **Read** drop-down menu and click **Read/Write**.



File Sharing

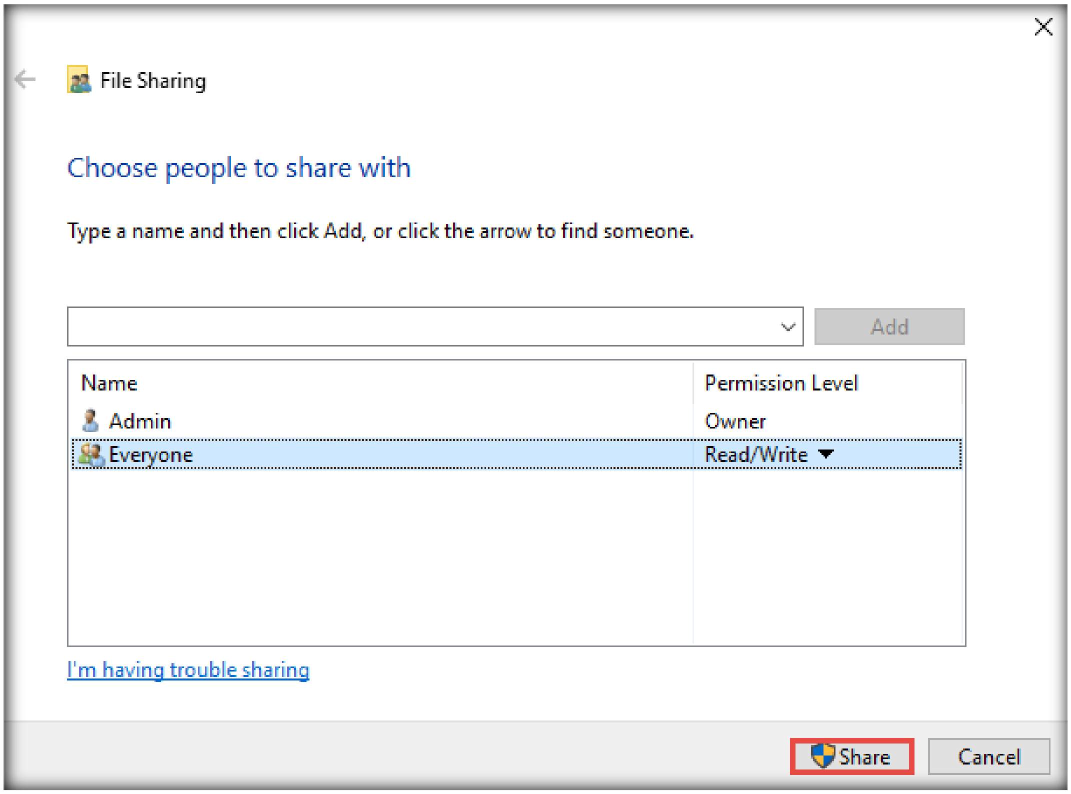
Choose people to share with

Type a name and then click Add, or click the arrow to find someone.

| Name | Permission Level |
|---|---|
| Admin | Owner |
| Everyone | Read |

Add
Read
Read/Write
Remove
I'm having trouble sharing
Share
Cancel

7. Click **Share** to begin sharing with the added users.



File Sharing

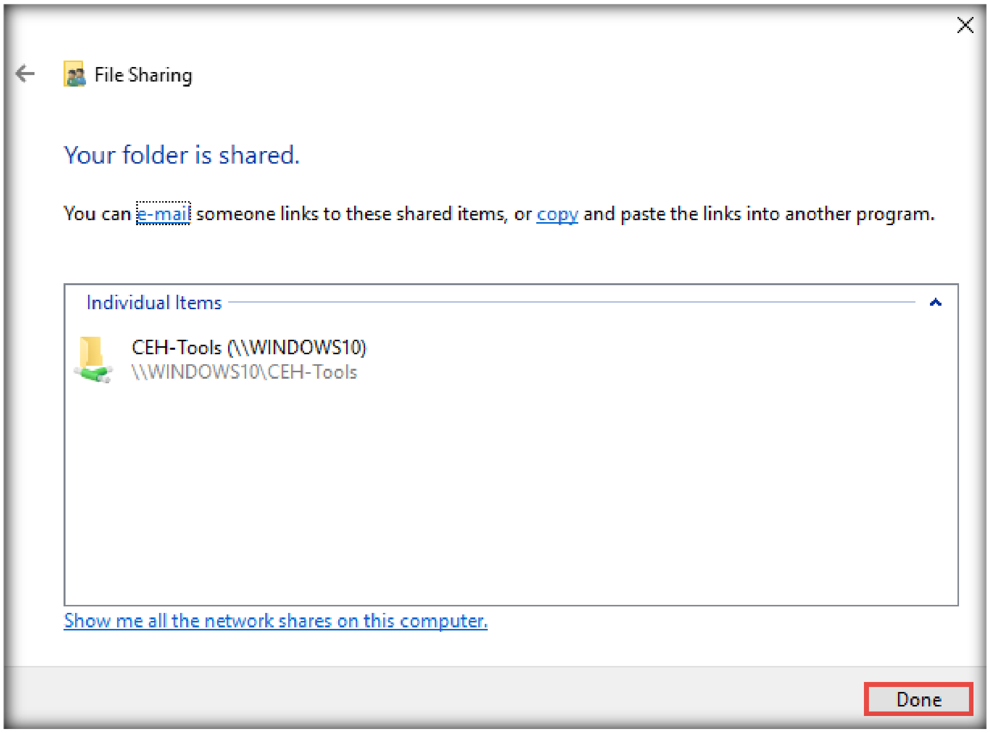
Choose people to share with

Type a name and then click Add, or click the arrow to find someone.

| Name | Permission Level |
|---|---|
| Admin | Owner |
| Everyone | Read/Write |

Add
I'm having trouble sharing
Share
Cancel

8. Click **Done** on the confirmation page of the **File Sharing** wizard.



File Sharing

Your folder is shared.

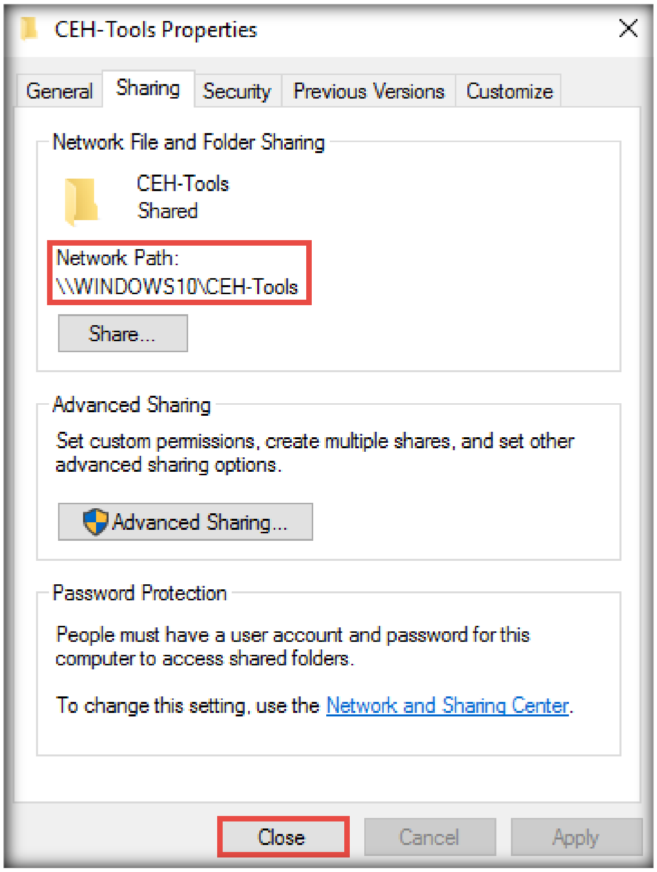
You can e-mail someone links to these shared items, or copy and paste the links into another program.

Individual Items

CEH-Tools (\\WINDOWS10)
\\WINDOWS10\CEH-Tools

Show me all the network shares on this computer.

9. Close the **CEH-Tools Properties** window.



CEH-Tools Properties

General
Sharing
Security
Previous Versions
Customize

Network File and Folder Sharing

CEH-Tools
Shared

Network Path:
\\WINDOWS10\CEH-Tools

Share...

Advanced Sharing

Set custom permissions, create multiple shares, and set other advanced sharing options.

Advanced Sharing...

Password Protection

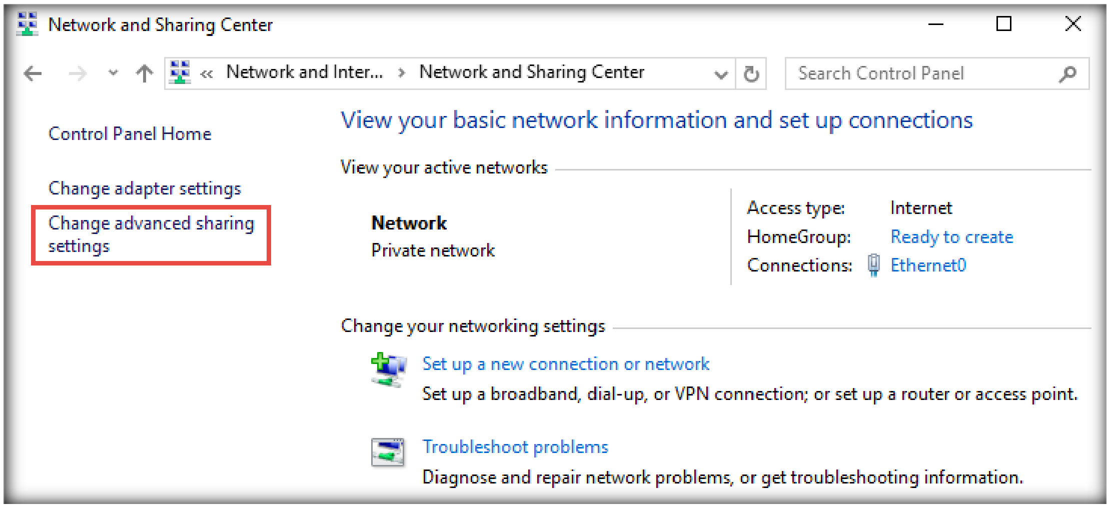
People must have a user account and password for this computer to access shared folders.

To change this setting, use the Network and Sharing Center.

Close
Cancel
Apply

10. Open **Network and Sharing Center** by navigating to **Control Panel** → **Network and Internet** → **Network and Sharing Center**.

11. In the **Network and Sharing Center** window, click the **Change advanced sharing settings** link in the left pane.



Network and Sharing Center

View your basic network information and set up connections

View your active networks

Network
Private network

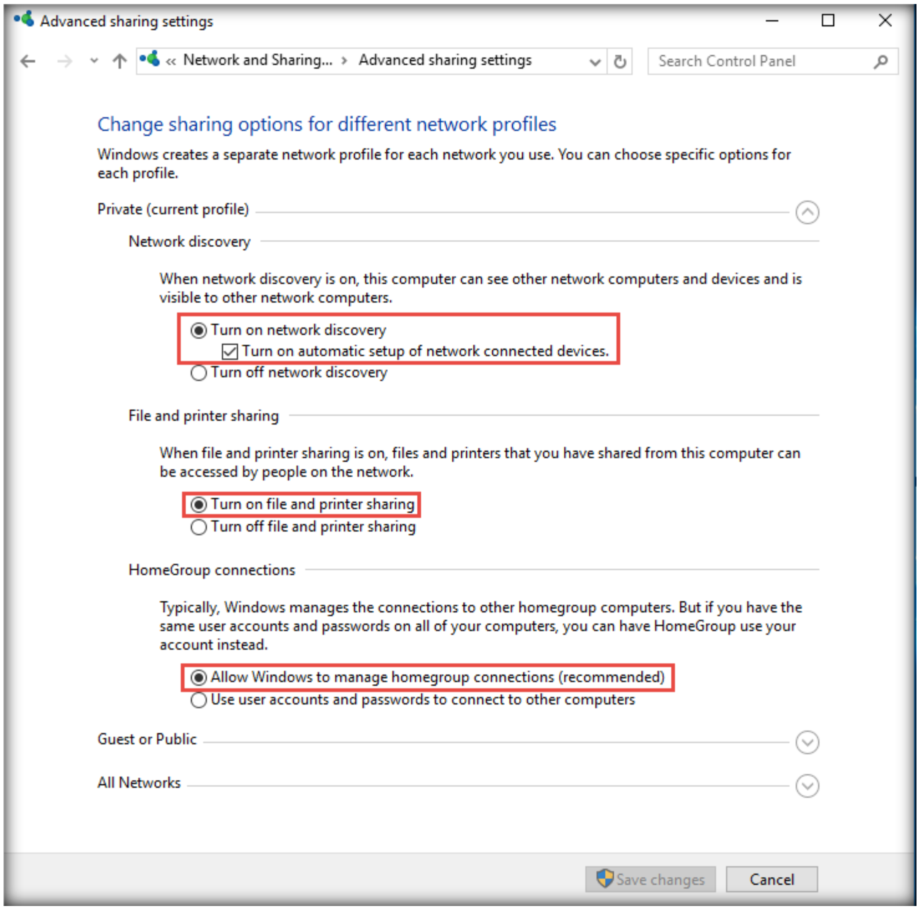
Access type: Internet
HomeGroup: Ready to create
Connections: Ethernet0

Change your networking settings

Set up a new connection or network
Set up a broadband, dial-up, or VPN connection; or set up a router or access point.

Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.

12. In the **Advanced sharing settings** window, turn on network discovery and file and printer sharing under **Private (current profile)**, **Guest or Public**, and **All Networks**, as shown in the screenshots, and click **Save changes**.



Change sharing options for different network profiles

Windows creates a separate network profile for each network you use. You can choose specific options for each profile.

Private (current profile)

Network discovery

When network discovery is on, this computer can see other network computers and devices and is visible to other network computers.

● Turn on network discovery
☑ Turn on automatic setup of network connected devices.
○ Turn off network discovery

File and printer sharing

When file and printer sharing is on, files and printers that you have shared from this computer can be accessed by people on the network.

● Turn on file and printer sharing
○ Turn off file and printer sharing

HomeGroup connections

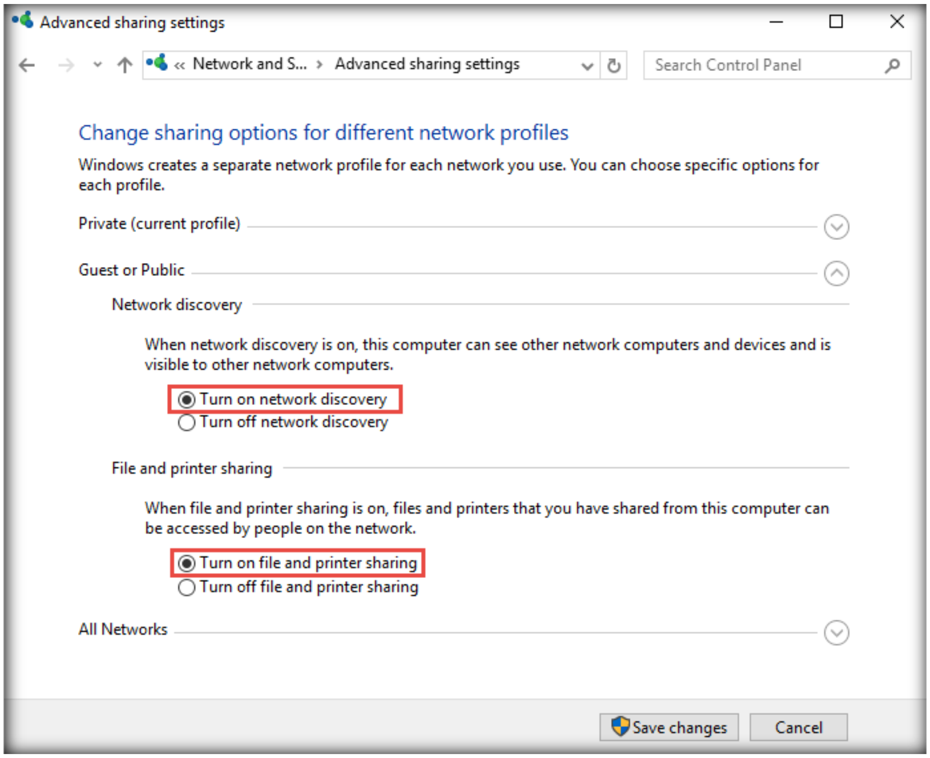
Typically, Windows manages the connections to other homegroup computers. But if you have the same user accounts and passwords on all of your computers, you can have HomeGroup use your account instead.

● Allow Windows to manage homegroup connections (recommended)
○ Use user accounts and passwords to connect to other computers

Guest or Public

All Networks

Advanced sharing settings
Network and Sharing... › Advanced sharing settings
Search Control Panel
Save changes
Cancel


Advanced sharing settings
« Network and S... › Advanced sharing settings
Search Control Panel

Change sharing options for different network profiles

Windows creates a separate network profile for each network you use. You can choose specific options for each profile.

Private (current profile)

Guest or Public

Network discovery

When network discovery is on, this computer can see other network computers and devices and is visible to other network computers.

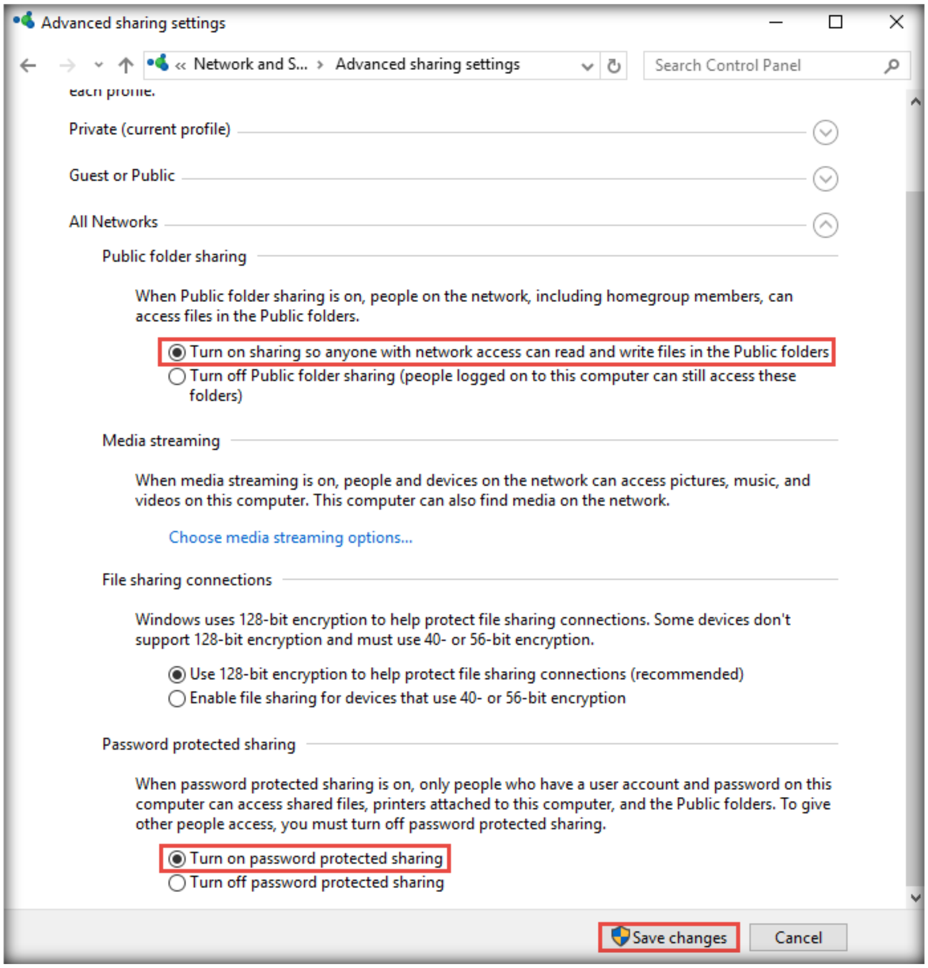
● Turn on network discovery
○ Turn off network discovery

File and printer sharing

When file and printer sharing is on, files and printers that you have shared from this computer can be accessed by people on the network.

● Turn on file and printer sharing
○ Turn off file and printer sharing

All Networks


Advanced sharing settings
« Network and S... › Advanced sharing settings
Search Control Panel

each profile.

Private (current profile)

Guest or Public

All Networks

Public folder sharing

When Public folder sharing is on, people on the network, including homegroup members, can access files in the Public folders.

● Turn on sharing so anyone with network access can read and write files in the Public folders
○ Turn off Public folder sharing (people logged on to this computer can still access these folders)

Media streaming

When media streaming is on, people and devices on the network can access pictures, music, and videos on this computer. This computer can also find media on the network.

Choose media streaming options...

File sharing connections

Windows uses 128-bit encryption to help protect file sharing connections. Some devices don't support 128-bit encryption and must use 40- or 56-bit encryption.

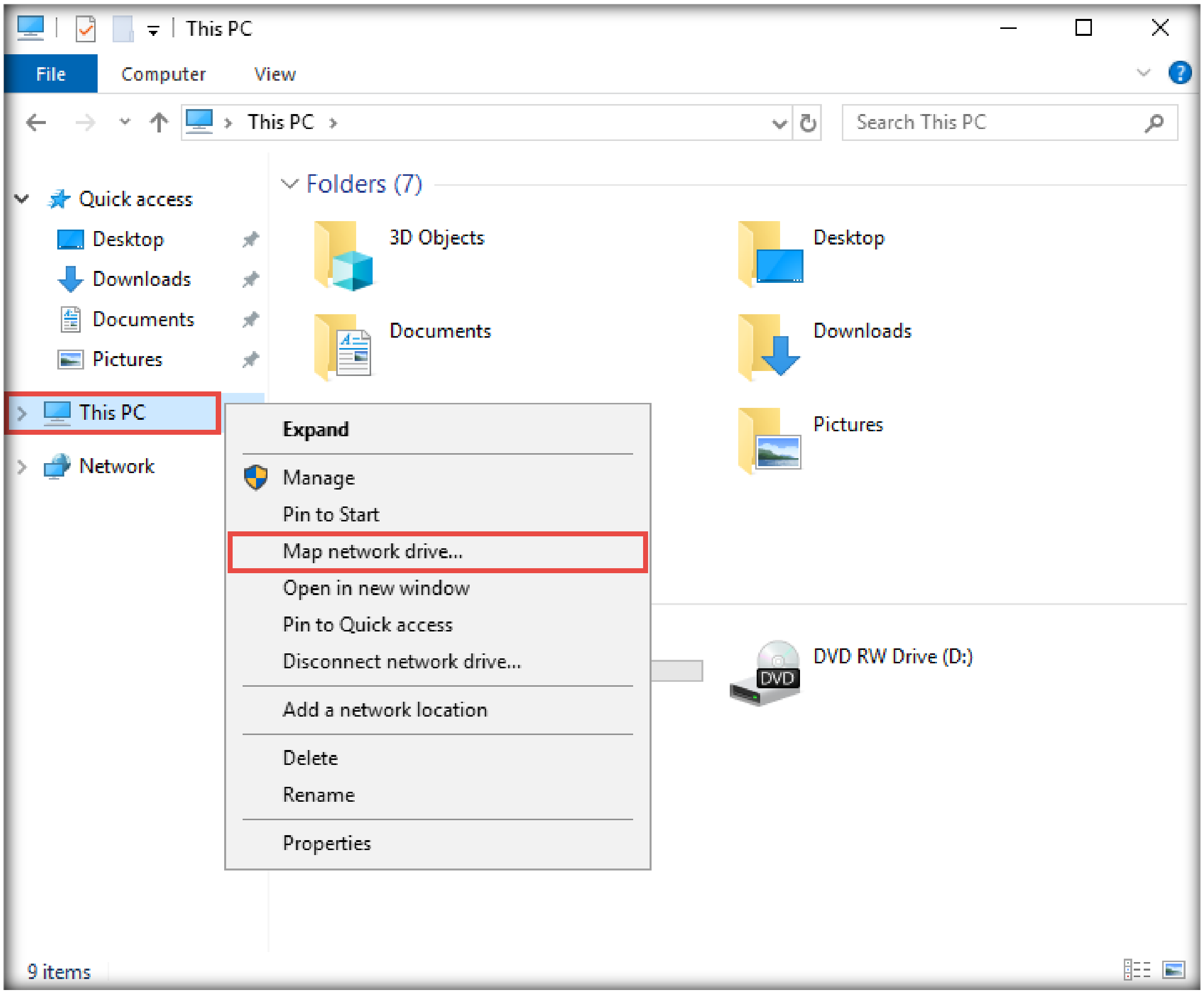
● Use 128-bit encryption to help protect file sharing connections (recommended)
○ Enable file sharing for devices that use 40- or 56-bit encryption

Password protected sharing

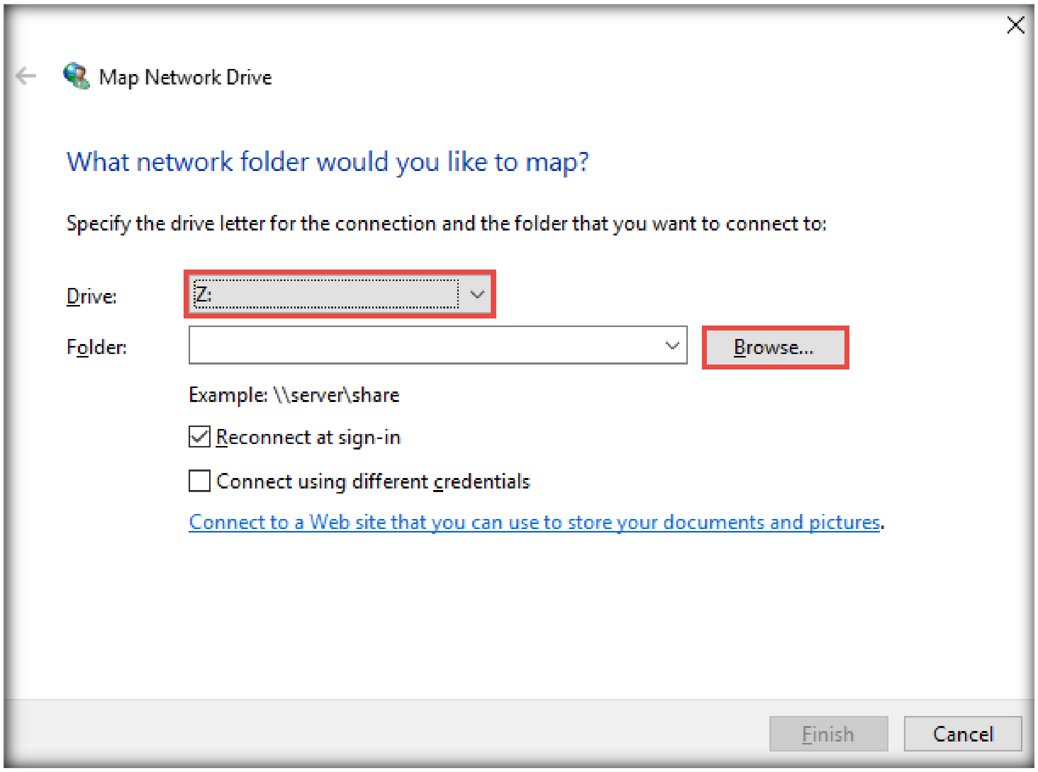
When password protected sharing is on, only people who have a user account and password on this computer can access shared files, printers attached to this computer, and the Public folders. To give other people access, you must turn off password protected sharing.

● Turn on password protected sharing
○ Turn off password protected sharing

13. Close the **Network and Sharing Center** window.
14. Log in to the **Windows Server 2019** virtual machine with the credentials **Administrator** and **Pa$$w0rd**
15. Open the **Network and Sharing Center** and click the **Change advanced sharing settings** link in the left pane.
16. In the **Advanced sharing settings** window, turn on the network discovery and file and printer sharing under **Private**, **Guest or Public (current profile)**, and **All Networks**, and click **Save changes**.
17. Open the **File Explorer** window, right-click **This PC** in the left-hand pane, and click **Map network drive...**


This PC
File
Computer
View
This PC
Search This PC
Quick access
Desktop
Downloads
Documents
Pictures
This PC
Network
Folders (7)
3D Objects
Desktop
Documents
Downloads
Pictures
DVD RW Drive (D:)
Expand
Manage
Pin to Start
Map network drive...
Open in new window
Pin to Quick access
Disconnect network drive...
Add a network location
Delete
Rename
Properties
9 items

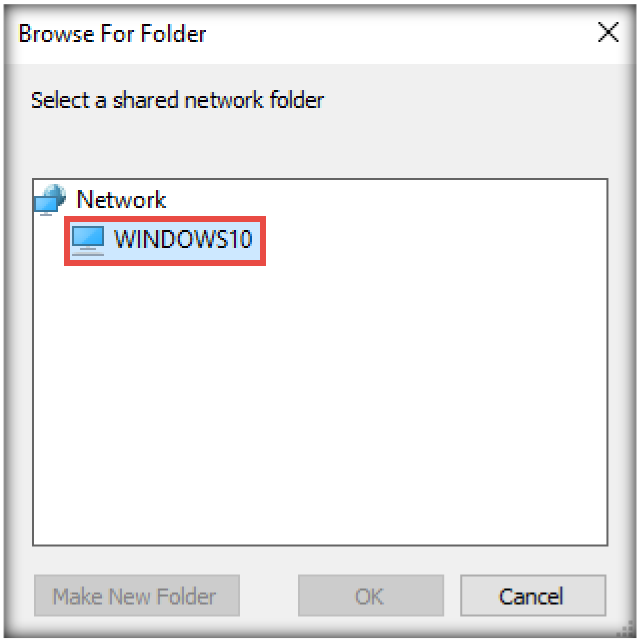
18. In the **Map Network Drive** window, specify the **Drive** letter as **Z:** and click **Browse** to select the shared folder.



Map Network Drive
What network folder would you like to map?
Specify the drive letter for the connection and the folder that you want to connect to:
Drive: Z:
Folder:
Browse...
Example: \\server\share
☑ Reconnect at sign-in
☐ Connect using different credentials
Connect to a Web site that you can use to store your documents and pictures.
Finish
Cancel

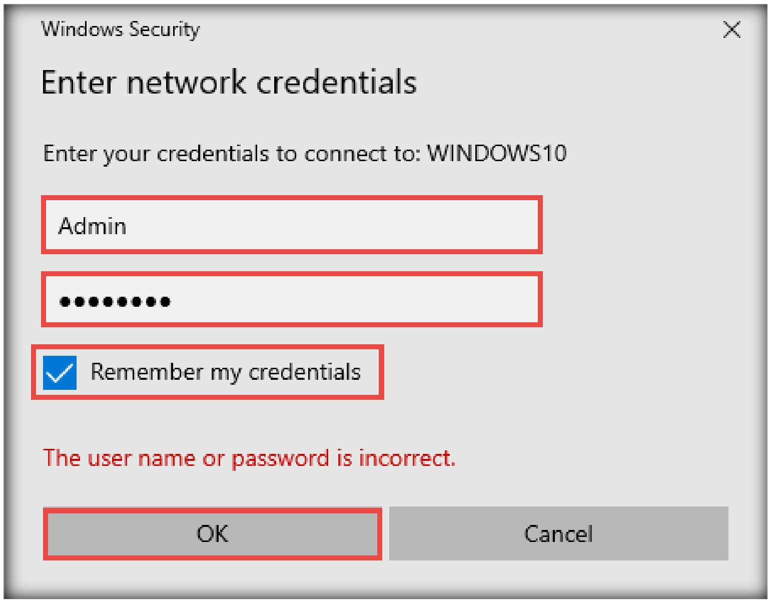
19. In the **Browse For Folder** window, click **WINDOWS10**.

**Note**: If **WINDOWS10** does not appear in the shared network folder list, then type the path **\\WINDOWS10\CEH-Tools** in the **Folder** field of the **Map Network Drive** window.



Browse For Folder
Select a shared network folder
Network
WINDOWS10
Make New Folder
OK
Cancel

20. The **Enter network credentials** pop-up window appears; enter the credentials of the Windows 10 virtual machine (**Admin** and **Pa$$w0rd**). Tick the **Remember my credentials** checkbox and click **OK**.



Windows Security

Enter network credentials

Enter your credentials to connect to: WINDOWS10

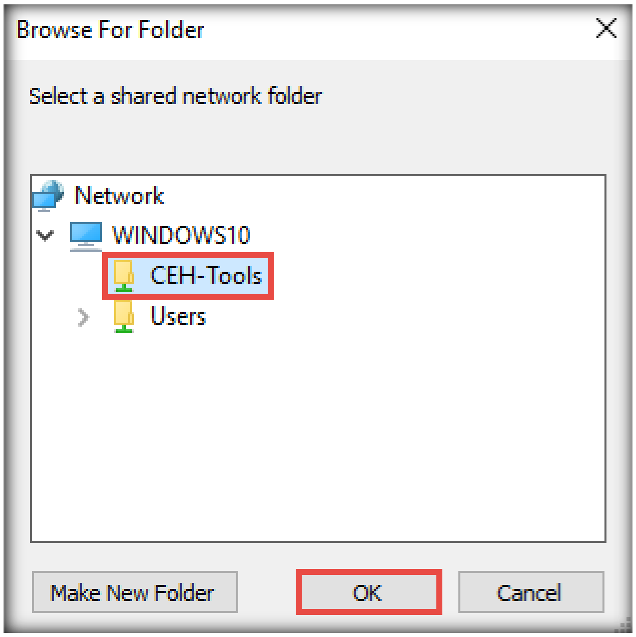
Admin

••••••••

☑ Remember my credentials

The user name or password is incorrect.

21. In the **Browse For Folder** window, select the **CEH-Tools** folder and click **OK**.

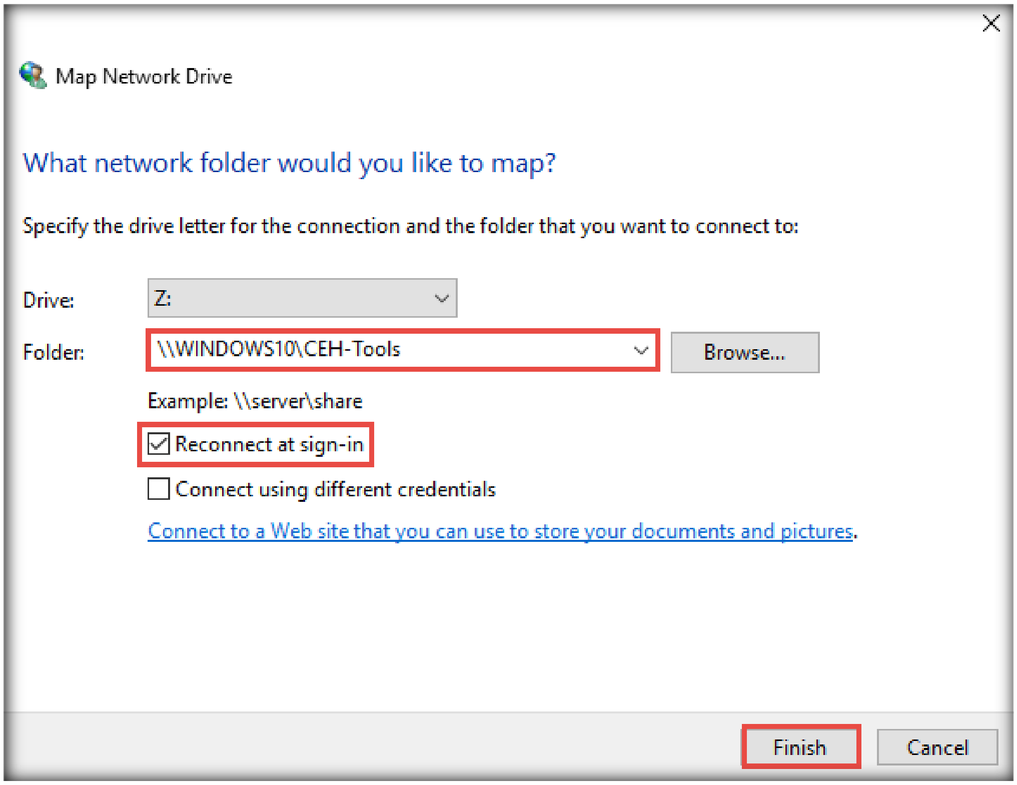


Browse For Folder

Select a shared network folder

Network
WINDOWS10
CEH-Tools
Users
Make New Folder
OK
Cancel

22. The **Map Network Drive** window will display the selected shared folder in the **Folder** field. Ensure that the **Reconnect at sign-in** checkbox is selected; click **Finish**.



Map Network Drive

What network folder would you like to map?

Specify the drive letter for the connection and the folder that you want to connect to:

Drive: Z:

Folder: \\WINDOWS10\CEH-Tools

Example: \\server\share

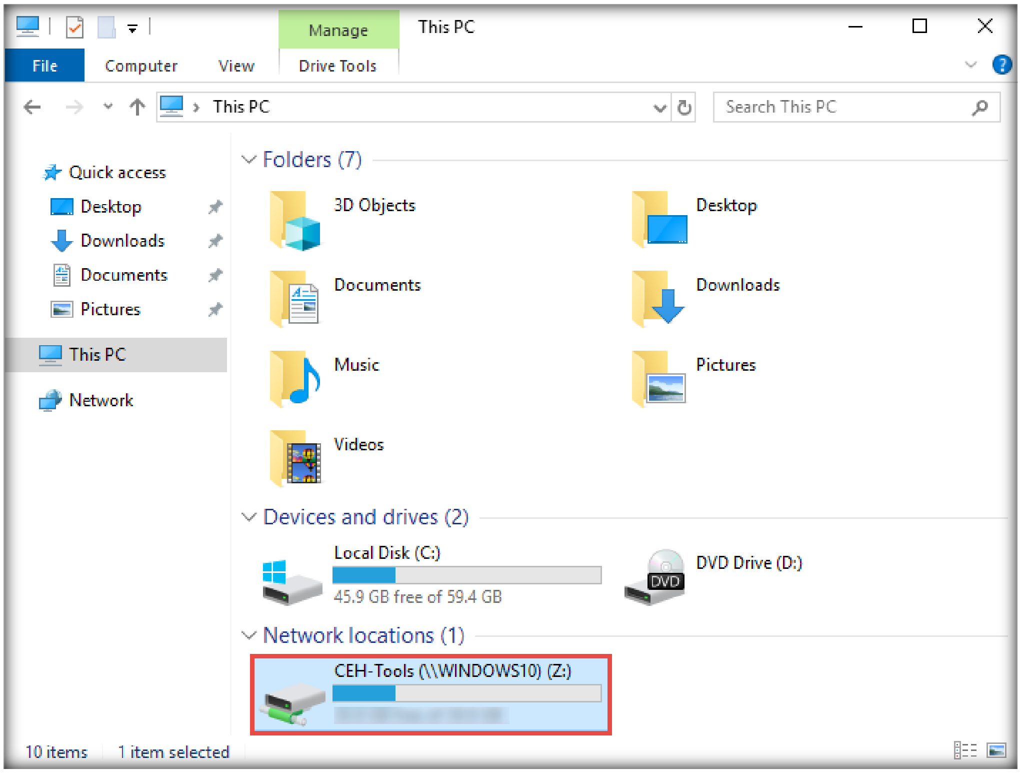
☑ Reconnect at sign-in

☐ Connect using different credentials

Connect to a Web site that you can use to store your documents and pictures.

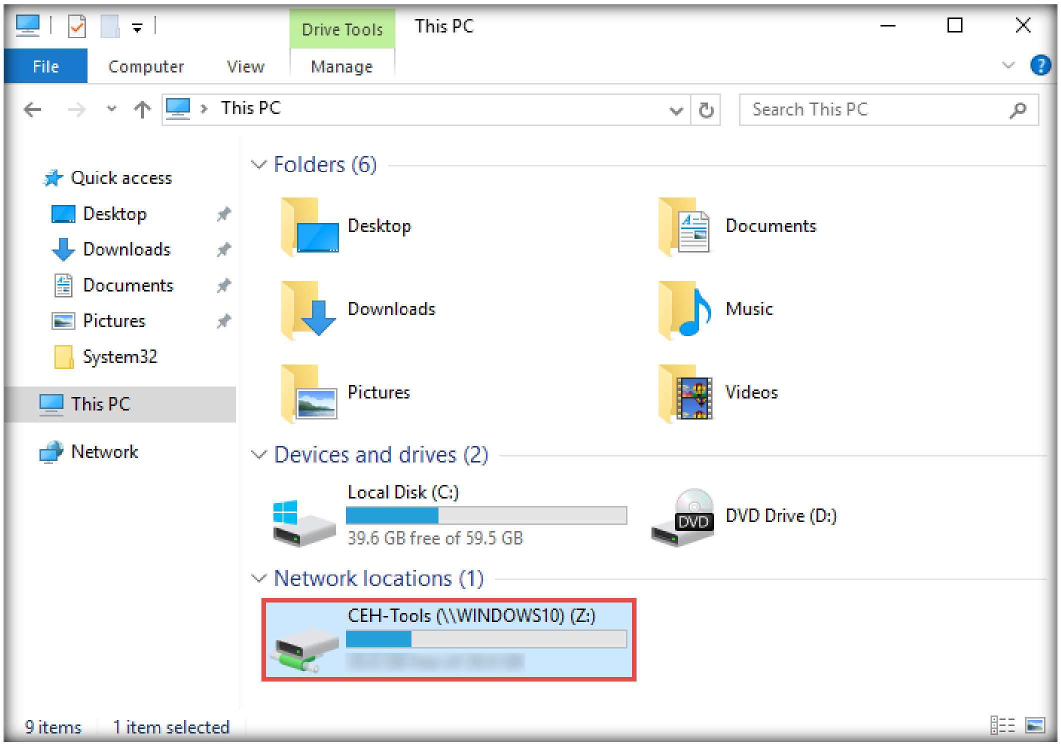
Browse...
Finish
Cancel

23. You will now see **Shared Folder** in **Windows Explorer**.



Manage
This PC
File
Computer
View
Drive Tools
This PC
Search This PC
Quick access
Desktop
Downloads
Documents
Pictures
This PC
Network
Folders (7)
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Devices and drives (2)
Local Disk (C:)
45.9 GB free of 59.4 GB
DVD
DVD Drive (D:)
Network locations (1)
CEH-Tools (\\WINDOWS10) (Z:)
10 items
1 item selected

24. Similarly, follow the above steps to map the shared folder in the **Windows Server 2016** virtual machine.


Drive Tools
This PC
File
Computer
View
Manage
This PC
Search This PC
Quick access
Desktop
Downloads
Documents
Pictures
System32
This PC
Network
Folders (6)
Desktop
Documents
Downloads
Music
Pictures
Videos
Devices and drives (2)
Local Disk (C:)
39.6 GB free of 59.5 GB
DVD
DVD Drive (D:)
Network locations (1)
CEH-Tools (\\WINDOWS10) (Z:)
9 items
1 item selected

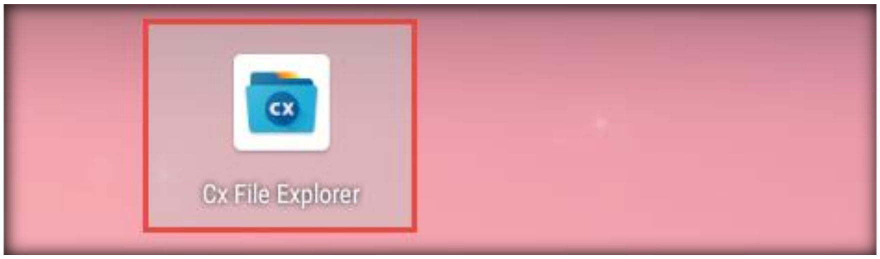
25. Turn off the **Windows Server 2019** and **Windows Server 2016** virtual machines.

[Back to Configuration Task Outline]

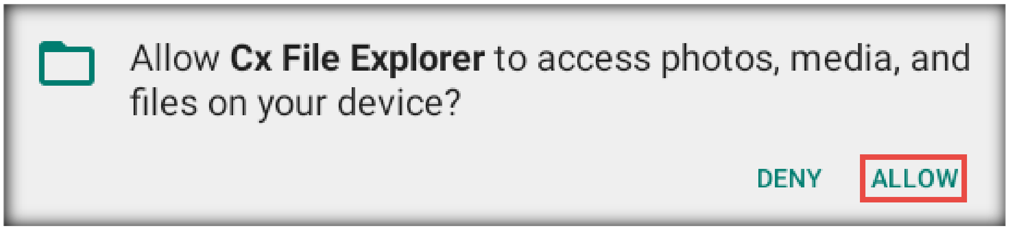
# CT#19: Map CEH-Tools with the Android Virtual Machine

1. Turn on the **Android** and **Windows 10** virtual machines from **VMware Workstation**.
2. Navigate to the second page in **Home Screen** and click **Cx File Managers**.

**Note**: To move to the second page, use the mouse to grab and swipe the screen to the left.

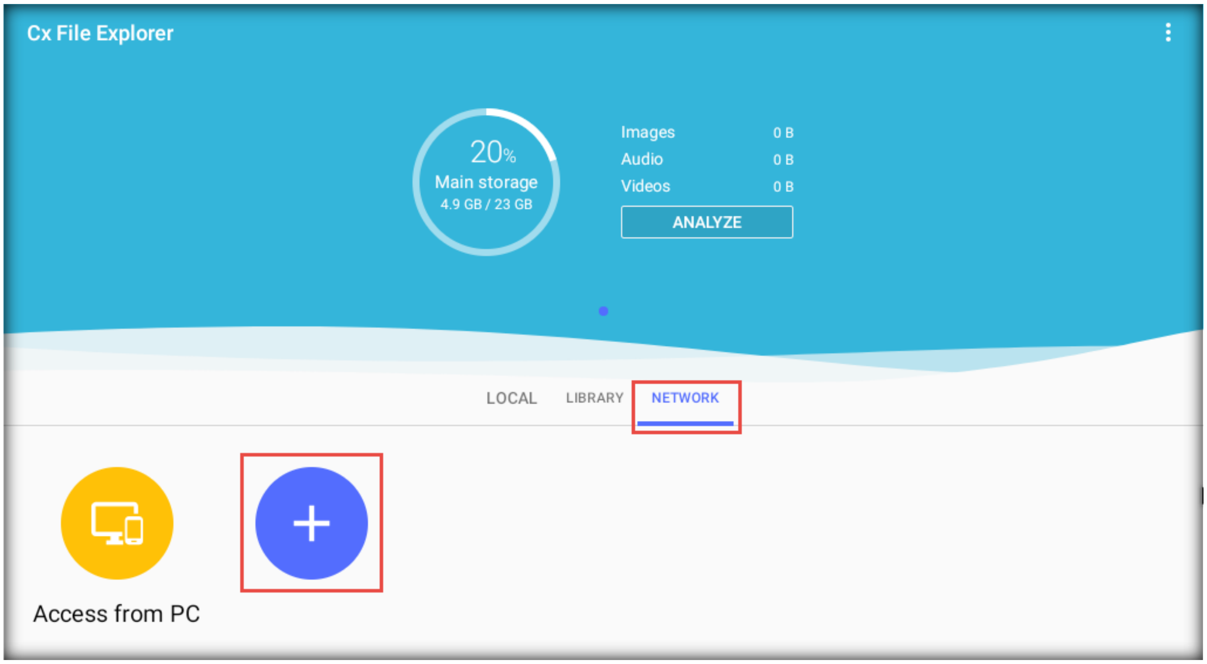

Cx File Explorer

3. Click **ALLOW**.

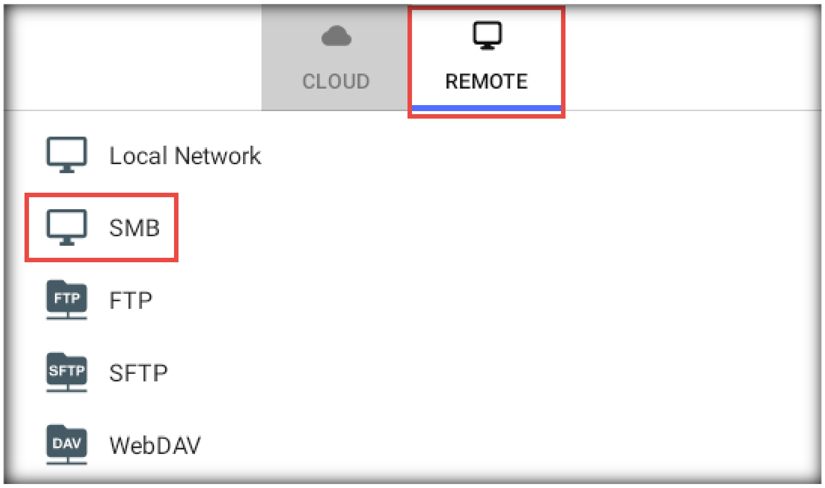


Allow **Cx File Explorer** to access photos, media, and files on your device?

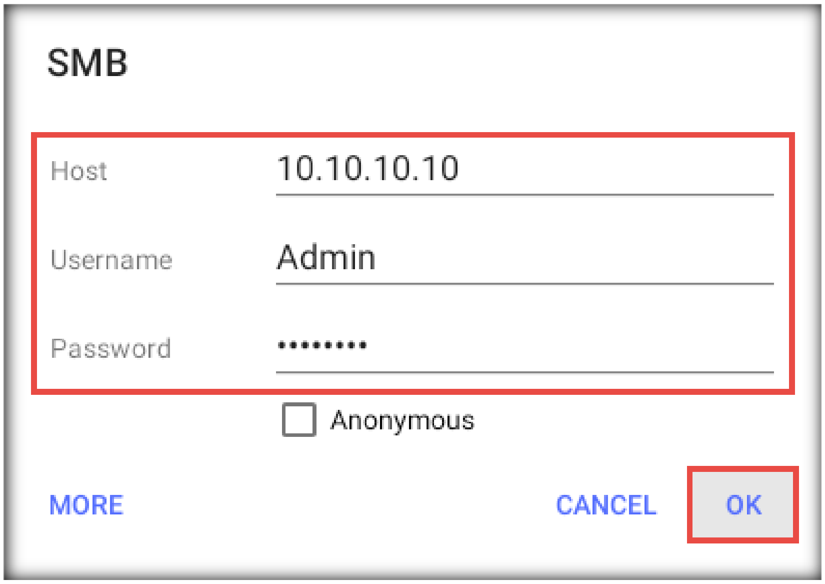
4. The **Cx File Explorer** page appears. Navigate to the **NETWORK** tab and click the **+** icon.


Cx File Explorer
20%
Main storage
4.9 GB / 23 GB
Images 0 B
Audio 0 B
Videos 0 B
ANALYZE
LOCAL
LIBRARY
NETWORK
Access from PC

5. The **CLOUD** pop-up appears; click the **REMOTE** tab; on the remote page, click the **SMB** option.


CLOUD
REMOTE
Local Network
SMB
FTP
SFTP
WebDAV

6. The **SMB** security pop-up appears. Enter the **Host** IP address as **10.10.10.10**, and the **Username** and **Password** as **Admin** and **Pa$$word**; click **OK**.


SMB

Host 10.10.10.10

Username Admin

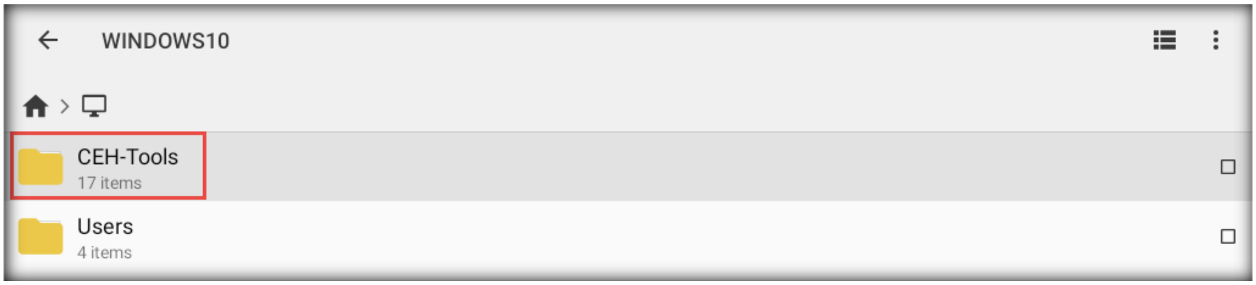
Password ••••••••

☐ Anonymous

MORE
CANCEL
OK

7. The **WINDOWS10** shared directories appear. Now, you can access **CEH-Tools** on the **Android** virtual machine.

8. Close all open applications and turn off the **Android** virtual machine.


WINDOWS10
CEH-Tools
17 items
Users
4 items

[Back to Configuration Task Outline]

## CT#20: Install Adobe Acrobat Reader DC on all Windows Virtual Machines

1. Log in to the **Windows 10** virtual machine with the credentials **Admin** and **Pa$$w0rd**.
2. Open a **File Explorer** window and navigate to the **E:\CEH-Tools\CEHv11 Lab Prerequisites\Adobe Reader** folder.
3. Alternatively, you may download the latest version of **Adobe Acrobat Reader DC** from the Adobe official website.
4. Double-click the **AcroRdrDC1800920044_en_US.exe** install file to begin the installation. If a **User Account Control** pop-up window appears, click **Yes**.
5. Follow the **wizard-driven** installation steps and **complete** the installation by choosing the **default** options throughout the installation process. After the installation has completed, close all windows.
6. In the same way, install the application on the **Windows Server 2019** and **Windows Server 2016** virtual machines.

   **Note**: On the **Windows Server 2019** and **Windows Server 2016** virtual machines, navigate to the **Z:\CEHv11 Lab Prerequisites\Adobe Reader** folder to access the Adobe Reader setup file.

[Back to Configuration Task Outline]

## CT#21: Install WinRAR on the Windows Server 2019 and Windows Server 2016 Virtual Machines

1. Log in to the **Windows Server 2019** virtual machine using the credentials **Administrator** and **Pa$$w0rd**

**Note**: Ensure that the **Windows 10** virtual machine is also running.

2. Navigate to the **Z:\CEHv11 Lab Prerequisites\WinRAR** folder.
3. Alternatively, you may download the latest version of **WinRAR** from the official website.
4. Double click on the **winrar-x64-571.exe** setup file to begin the installation. If a **User Account Control** pop-up window appears, click **Yes**.
5. The **WinRAR** setup window appears; click **Install**.
6. Complete the installation by choosing the default options throughout the installation process.
7. After completing the installation, the installation location of WinRAR files window opens automatically. Close the window.
8. In the same way, install the application on **Windows Server 2016**.

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## CT#22: Install Notepad++ on all Windows Virtual Machines

1. On the **Windows 10** virtual machine, navigate to the **E:\CEH-Tools\CEHv11 Lab Prerequisites\Notepad++** folder.
2. Alternatively, you can also download the latest version of **Notepad++** from the official website.
3. Double click on the **npp.7.7.1.Installer.x64.exe** setup file to begin the installation. If a **User Account Control** pop-up window appears, click **Yes**.
4. The **Installer Language** window appears. Select **English** and press **OK**.
5. In the **Notepad++** setup window, follow the **wizard-driven** installation steps and **complete** the installation by choosing the **default** options throughout the installation process. After the installation has completed, uncheck the **Notepad++ v7.7.1** box and click **Finish** to close the window.
6. In the same way, install the application on the **Windows Server 2019** and **Windows Server 2016** virtual machines.

[Back to Configuration Task Outline]

## CT#23: Install Web Browsers on all Windows Virtual Machines

1. On the **Windows 10** virtual machine, navigate to the **E:\CEH-Tools\CEHv11 Lab Prerequisites\Web Browsers** folder.
2. Follow the **wizard-driven** installation steps to install the **Google Chrome** and **Mozilla Firefox** web browsers.
3. You can also download **latest** versions of web browsers from their respective **vendors**.
4. In the same way, install the browsers on the **Windows Server 2019** and **Windows Server 2016** virtual machines

[Back to Configuration Task Outline]

## CT#24: Install WinPCap on all Windows Virtual Machines

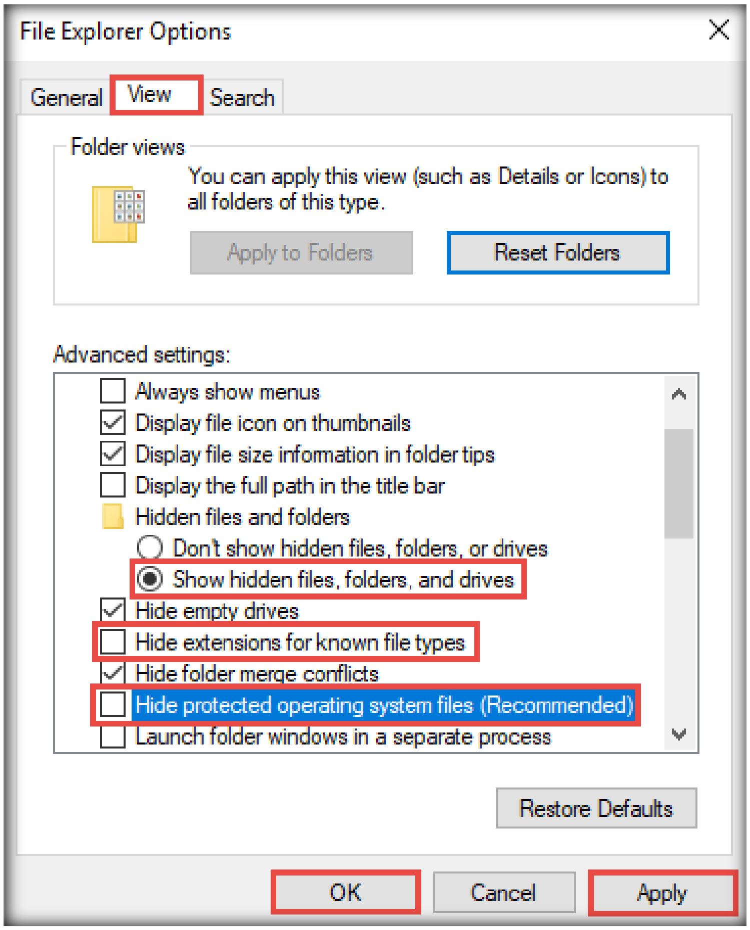
1. On the **Windows 10** virtual machine, navigate to the **E:\CEH-Tools\CEHv11 Lab Prerequisites\WinPcap** folder.
2. Double click on the **WinPcap_4_1_3.exe** setup file to begin the installation. If a **User Account Control** pop-up window appears, click **Yes**.
3. Follow the wizard-driven installation steps and complete the install by choosing the default options throughout the installation process.
4. In the same way, install the application on the **Windows Server 2019** and **Windows Server 2016** virtual machines.

[Back to Configuration Task Outline]

# CT#25: Configure File Explorer on all Windows Virtual Machines

1. On the **Windows 10** virtual machine, open the **Control Panel** and select **Small icons** from the **View by:** field present in the top-right corner of the window.
2. Click **File Explorer Options**. When the **File Explorer Options** window appears, click the **View** tab.
3. In the **Advanced settings** section, under **Hidden files and folders**, select the **Show hidden files, folders, and drives** radio button, uncheck the **Hide extensions for known file types** and **Hide protected operating system files (Recommended)** options, click **Apply**, and then click **OK**.

   **Note:** If a Warning pop-up appears, click **Yes**.



You can apply this view (such as Details or Icons) to all folders of this type.

Advanced settings:

☐ Always show menus
☑ Display file icon on thumbnails
☑ Display file size information in folder tips
☐ Display the full path in the title bar
Hidden files and folders
  ○ Don't show hidden files, folders, or drives
  ● Show hidden files, folders, and drives
☑ Hide empty drives
☐ Hide extensions for known file types
☑ Hide folder merge conflicts
☐ Hide protected operating system files (Recommended)
☐ Launch folder windows in a separate process

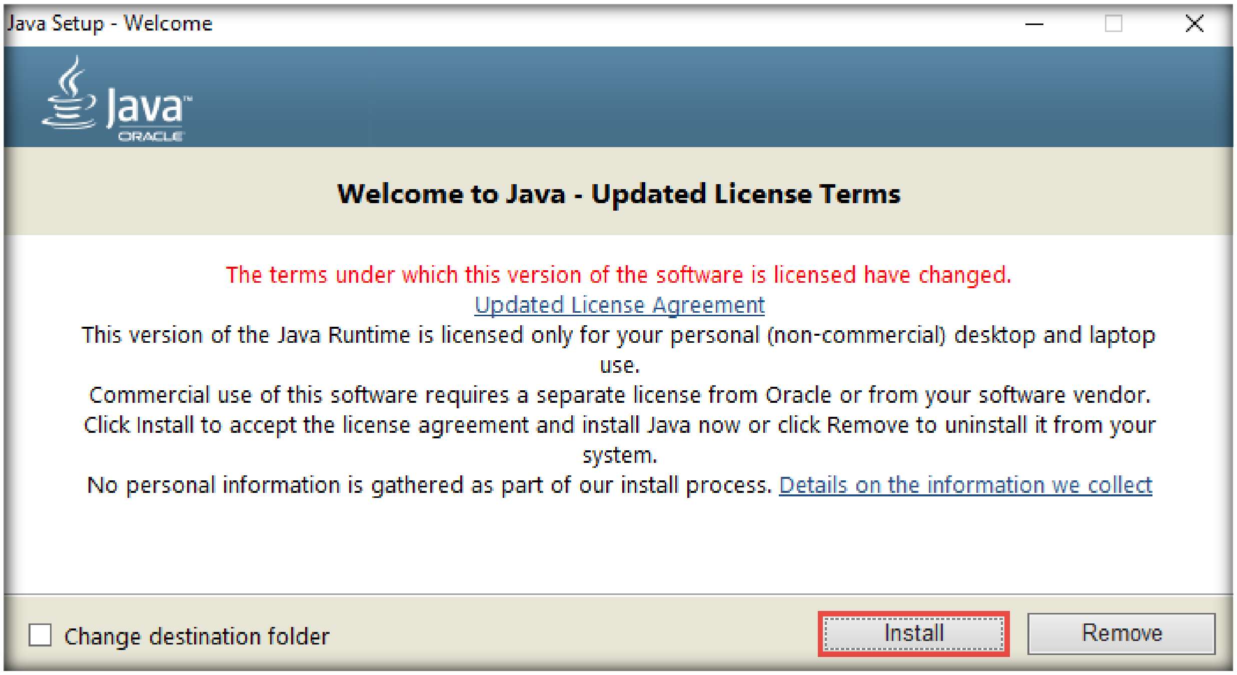
5. In the same way, configure the settings on the **Windows Server 2019** and **Windows Server 2016** virtual machines.

   **Note:** In different versions of windows, the **File Explorer Options** may be named "**Folder Options**."

[Back to Configuration Task Outline]

## CT#26: Install the Java Runtime Environment on the Windows Virtual Machines

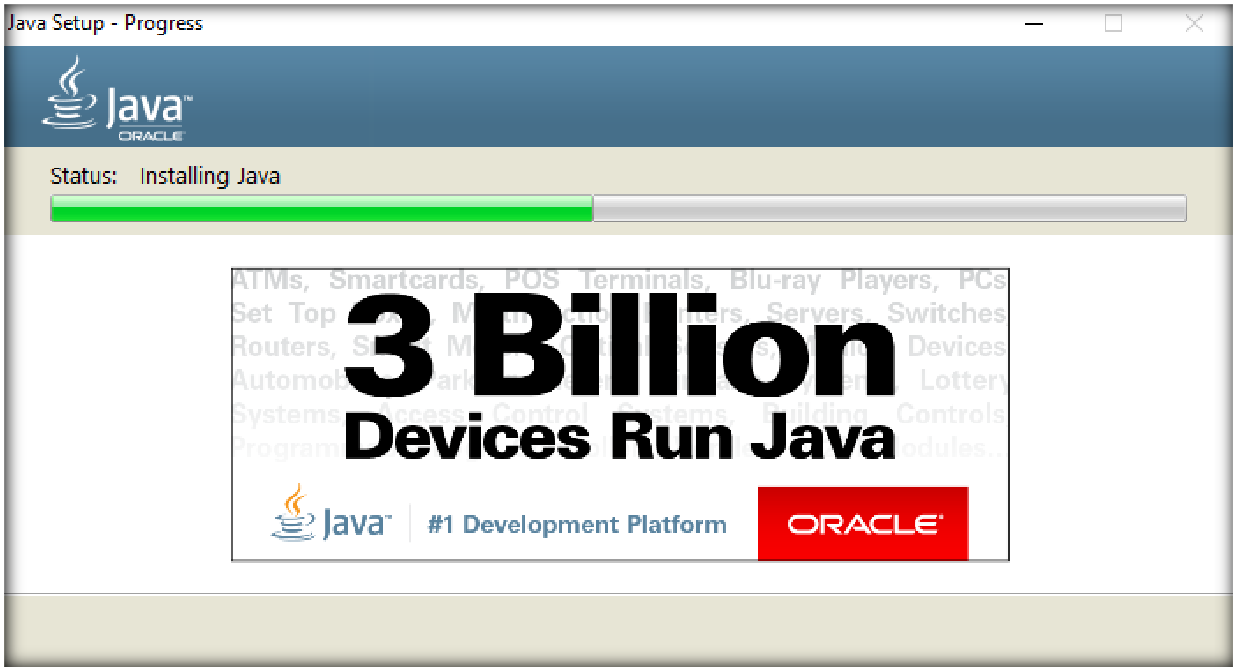
1. Log in to the **Windows Server 2019** virtual machine with the credentials **Administrator** and **Pa$$w0rd**.
2. Navigate to the **Z:\CEHv11 Lab Prerequisites\Java Runtime Environment** folder.
3. Alternatively, you may download the latest version of **Java Runtime Environment** from the official website.
4. Double click on the **jre-8u221-windows-x64.exe** setup file to begin the installation. If a **User Account Control** pop-up window appears, click **Yes**.
5. The **Java Setup - Welcome** setup window appears; click **Install**.



Welcome to Java - Updated License Terms

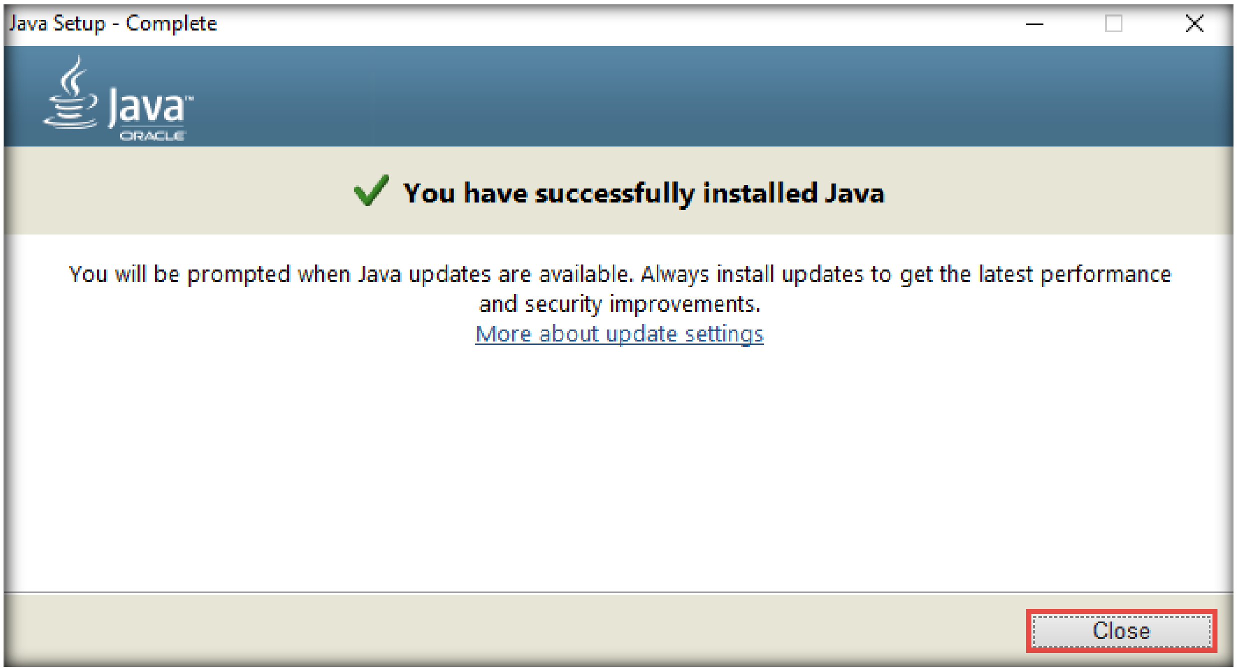
The terms under which this version of the software is licensed have changed.
Updated License Agreement
This version of the Java Runtime is licensed only for your personal (non-commercial) desktop and laptop use.
Commercial use of this software requires a separate license from Oracle or from your software vendor.
Click Install to accept the license agreement and install Java now or click Remove to uninstall it from your system.
No personal information is gathered as part of our install process. Details on the information we collect

6. The **Java Setup – Progress** installation window appears, showing the status of the installation process.


Java Setup - Progress
Java
ORACLE
3 Billion
Devices Run Java
Java
#1 Development Platform
ORACLE

Status: Installing Java

7. After completing the installation, close the window.


Java Setup - Complete
Java
ORACLE
More about update settings
Close

You have successfully installed Java

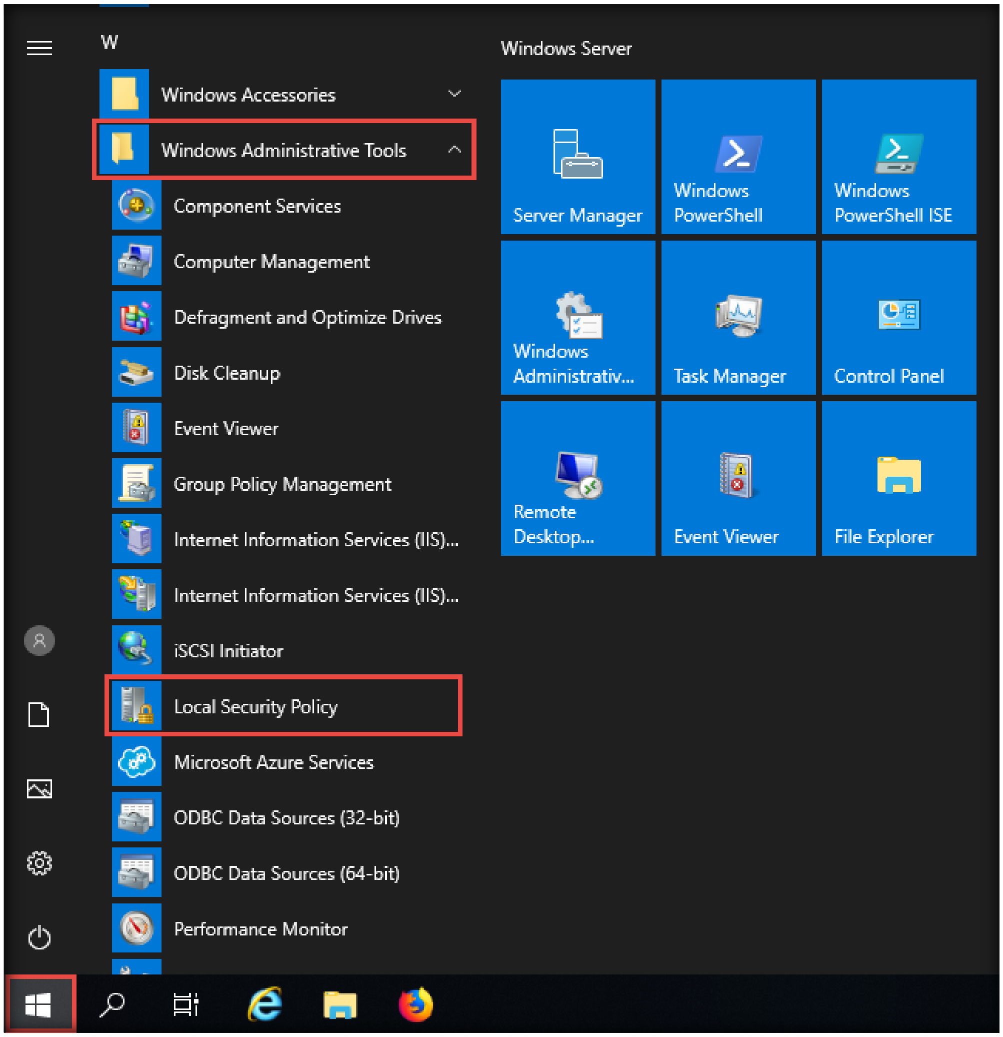
You will be prompted when Java updates are available. Always install updates to get the latest performance and security improvements.

8. In the same way, install the application on the **Windows Server 2016** and **Windows 10** virtual machines.

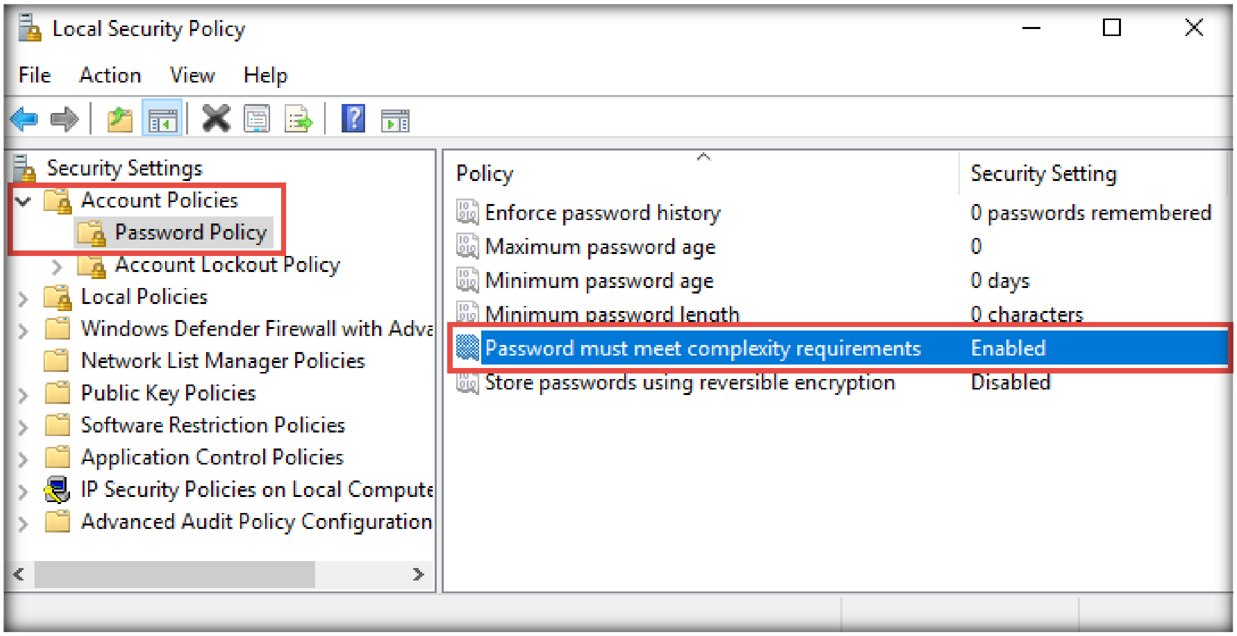
# CT#27: Remove Password Complexity from the Windows Virtual Machines

## Remove Password Complexity on Windows Server 2019 (Virtual Machine)

1. On the **Windows Server 2019** virtual machine, click the **Start** icon in the lower-left corner of the screen.
2. The **Start** menu appears; scroll-down and click **Windows Administrative Tools** → **Local Security Policy**.

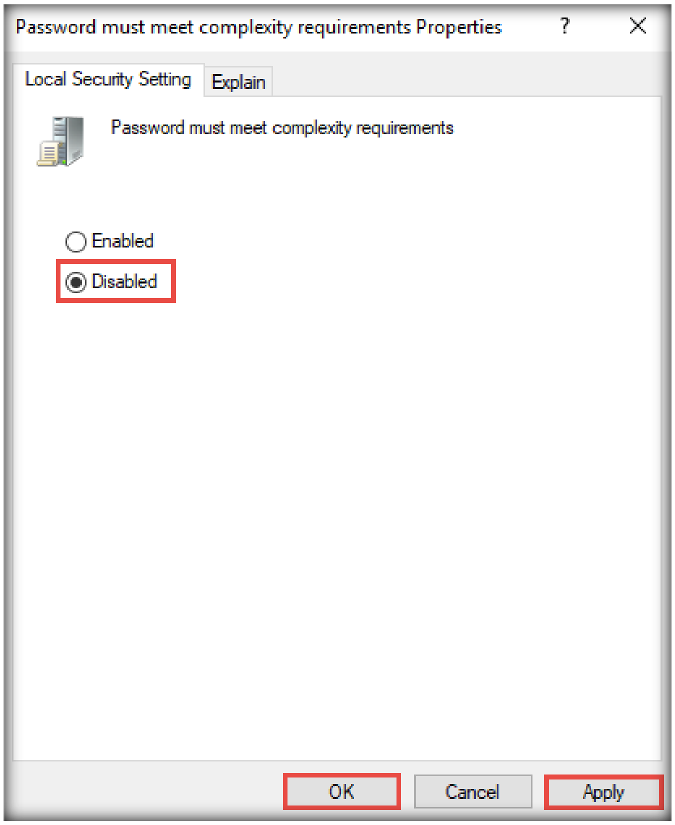

W
Windows Accessories
Windows Administrative Tools
Component Services
Computer Management
Defragment and Optimize Drives
Disk Cleanup
Event Viewer
Group Policy Management
Internet Information Services (IIS)...
Internet Information Services (IIS)...
iSCSI Initiator
Local Security Policy
Microsoft Azure Services
ODBC Data Sources (32-bit)
ODBC Data Sources (64-bit)
Performance Monitor
Windows Server
Server Manager
Windows PowerShell
Windows PowerShell ISE
Windows Administrativ...
Task Manager
Control Panel
Remote Desktop...
Event Viewer
File Explorer

3. The **Local Security Policy** window appears. Expand the **Account Policies** node, click **Password Policy** in the left pane, and in the right pane, double-click **Password must meet complexity requirements**.


Local Security Policy
File
Action
View
Help
Security Settings
Account Policies
Password Policy
Account Lockout Policy
Local Policies
Windows Defender Firewall with Adva
Network List Manager Policies
Public Key Policies
Software Restriction Policies
Application Control Policies
IP Security Policies on Local Compute
Advanced Audit Policy Configuration

| Policy | Security Setting |
|---|---|
| Enforce password history | 0 passwords remembered |
| Maximum password age | 0 |
| Minimum password age | 0 days |
| Minimum password length | 0 characters |
| Password must meet complexity requirements | Enabled |
| Store passwords using reversible encryption | Disabled |

4. The **Password must meet complexity requirements Properties** window appears; select the **Disabled** radio button, and click **Apply** and **OK**.

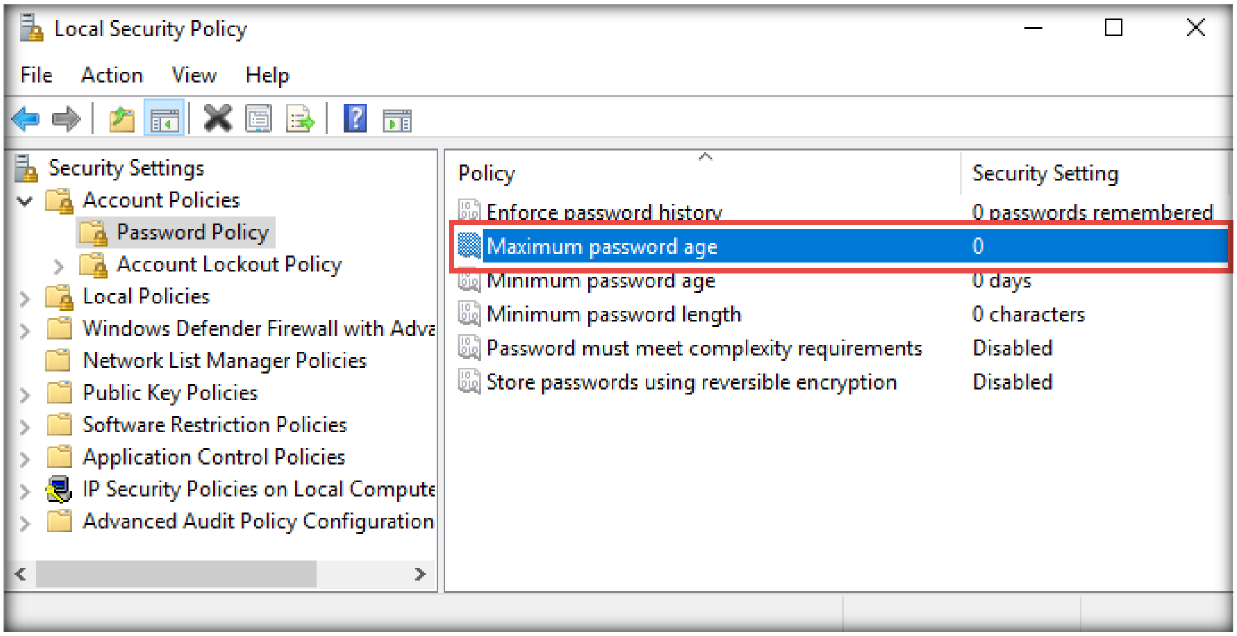

Password must meet complexity requirements Properties
?
Local Security Setting
Explain
OK
Cancel
Apply

Password must meet complexity requirements

○ Enabled
● Disabled

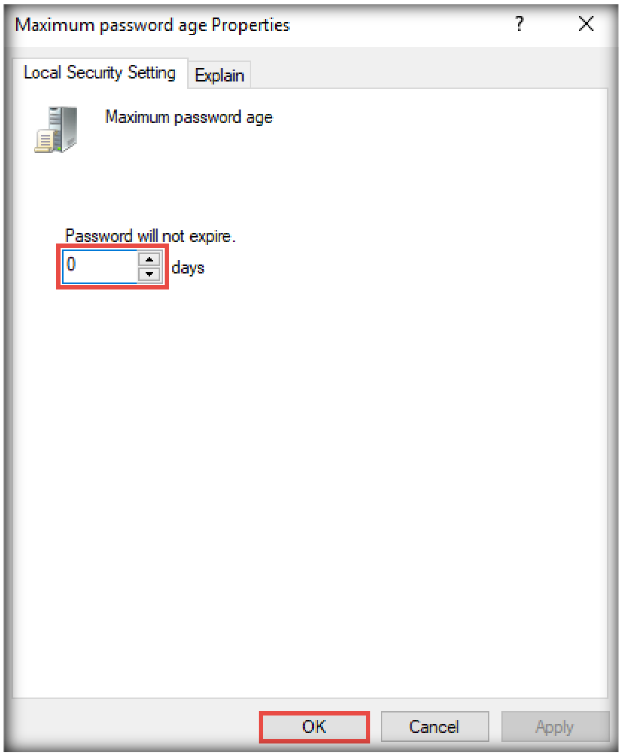
## Remove the Maximum Password Age on Windows Server 2019 (Virtual Machine)

5. In the right-hand pane, double-click **Maximum password age**.


Local Security Policy
File Action View Help
Security Settings
Account Policies
Password Policy
Account Lockout Policy
Local Policies
Windows Defender Firewall with Adva
Network List Manager Policies
Public Key Policies
Software Restriction Policies
Application Control Policies
IP Security Policies on Local Compute
Advanced Audit Policy Configuration

| Policy | Security Setting |
|---|---|
| Enforce password history | 0 passwords remembered |
| Maximum password age | 0 |
| Minimum password age | 0 days |
| Minimum password length | 0 characters |
| Password must meet complexity requirements | Disabled |
| Store passwords using reversible encryption | Disabled |

6. The **Maximum password age Properties** window appears; ensure that **0** days is selected under the **Password will expire in** section; click **Apply** and **OK**.

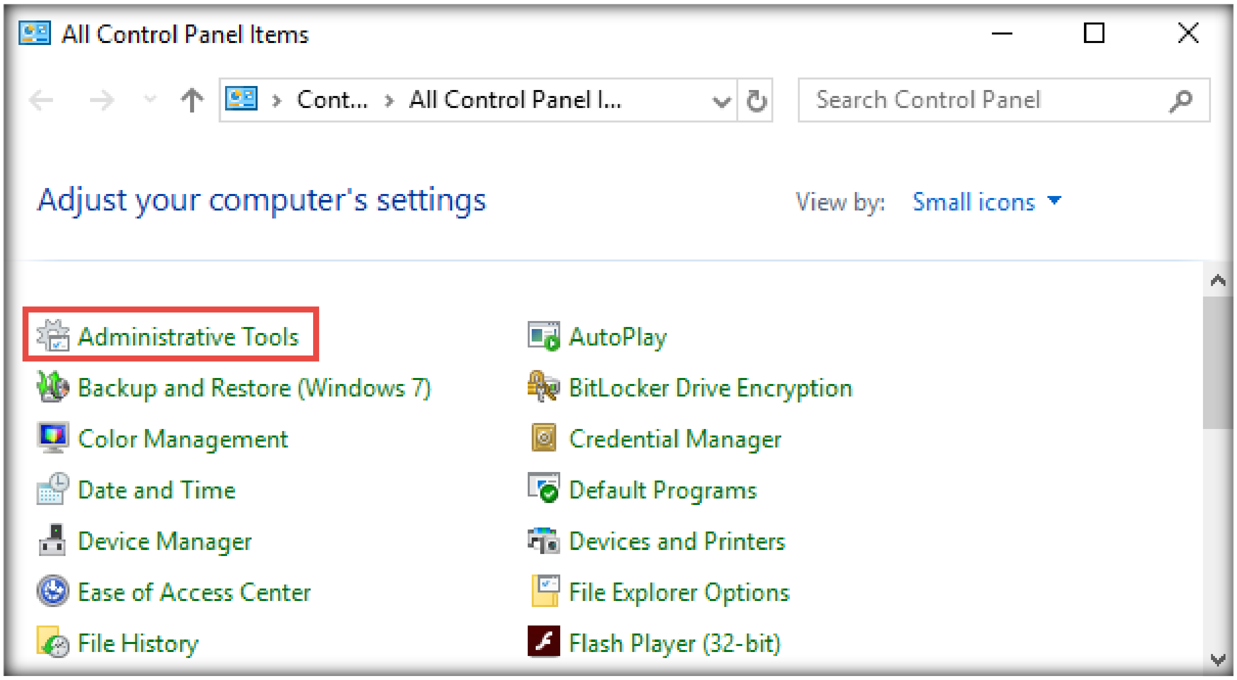

Maximum password age Properties
Local Security Setting
Explain
Maximum password age
OK
Cancel
Apply

Password will not expire.
0 days

7. In the same way, remove the password complexity and maximum password age on the **Windows Server 2016** virtual machine.

## Remove the Password Complexity and Maximum Password Age in Windows 10 (Virtual Machine)

8. On the **Windows 10** virtual machine, open **Control Panel** and select **Small icons** from the **View by:** field in the top-right corner of the window.
9. In the **All Control Panel Items** window, click **Administrative Tools**.



All Control Panel Items

Cont... › All Control Panel I...

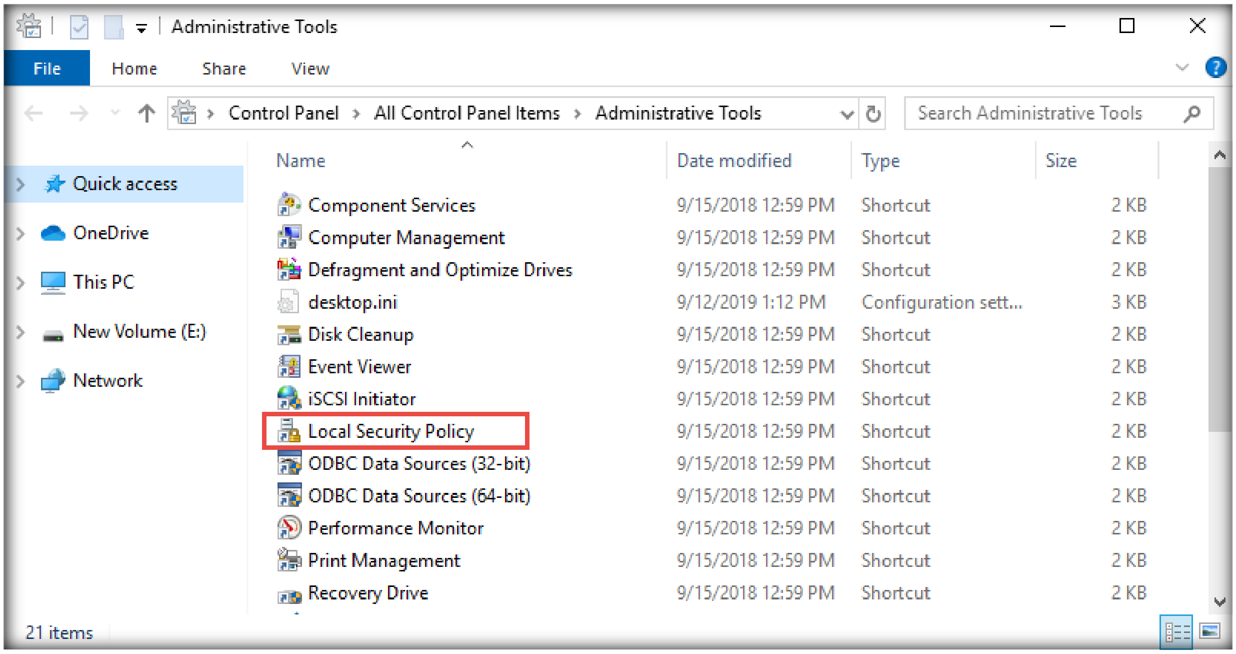
Search Control Panel

Adjust your computer's settings

View by: Small icons

| | |
|---|---|
| Administrative Tools | AutoPlay |
| Backup and Restore (Windows 7) | BitLocker Drive Encryption |
| Color Management | Credential Manager |
| Date and Time | Default Programs |
| Device Manager | Devices and Printers |
| Ease of Access Center | File Explorer Options |
| File History | Flash Player (32-bit) |

10. The **Administrative Tools** window appears; double-click **Local Security Policy**.



Administrative Tools

File Home Share View

Control Panel › All Control Panel Items › Administrative Tools

Search Administrative Tools

Quick access
OneDrive
This PC
New Volume (E:)
Network

| Name | Date modified | Type | Size |
|---|---|---|---|
| Component Services | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| Computer Management | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| Defragment and Optimize Drives | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| desktop.ini | 9/12/2019 1:12 PM | Configuration sett... | 3 KB |
| Disk Cleanup | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| Event Viewer | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| iSCSI Initiator | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| Local Security Policy | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| ODBC Data Sources (32-bit) | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| ODBC Data Sources (64-bit) | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| Performance Monitor | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| Print Management | 9/15/2018 12:59 PM | Shortcut | 2 KB |
| Recovery Drive | 9/15/2018 12:59 PM | Shortcut | 2 KB |

21 items

11. The **Local Security Policy** window appears. Expand the **Account Policies** node, click **Password Policy** in the left pane, and in the right pane, double-click **Password must meet complexity requirements**.
12. The **Password must meet complexity requirements Properties** window appears; ensure that the **Disabled** radio button is selected and click **OK**.
13. In the right pane, double-click **Maximum password age**.
14. The **Maximum password age Properties** window appears; ensure that **0** days is selected under the **Password will expire in** section; click **OK**.
15. Close all windows.

[Back to Configuration Task Outline]

# CT#28: Creating Demo User Accounts on the Windows Server 2019 and Windows 10 Virtual Machines

For demonstration purpose, we are creating three different accounts. Create all three user accounts on all machines. Below are the user account details:

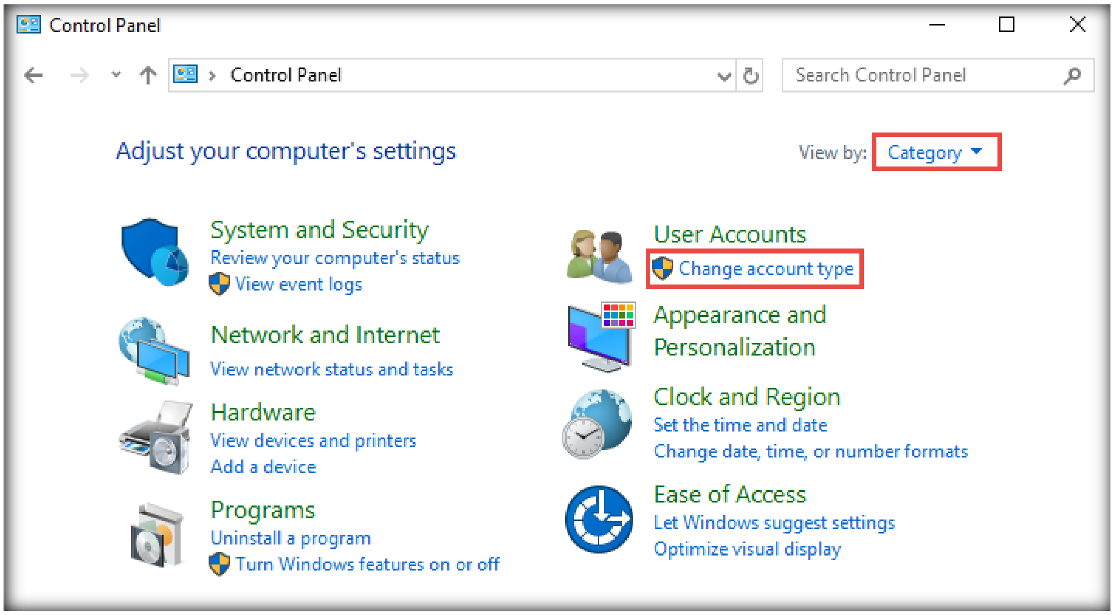
(i) Username: **Martin**; Password: **apple**

(ii) Username: **Jason**; Password: **qwerty**

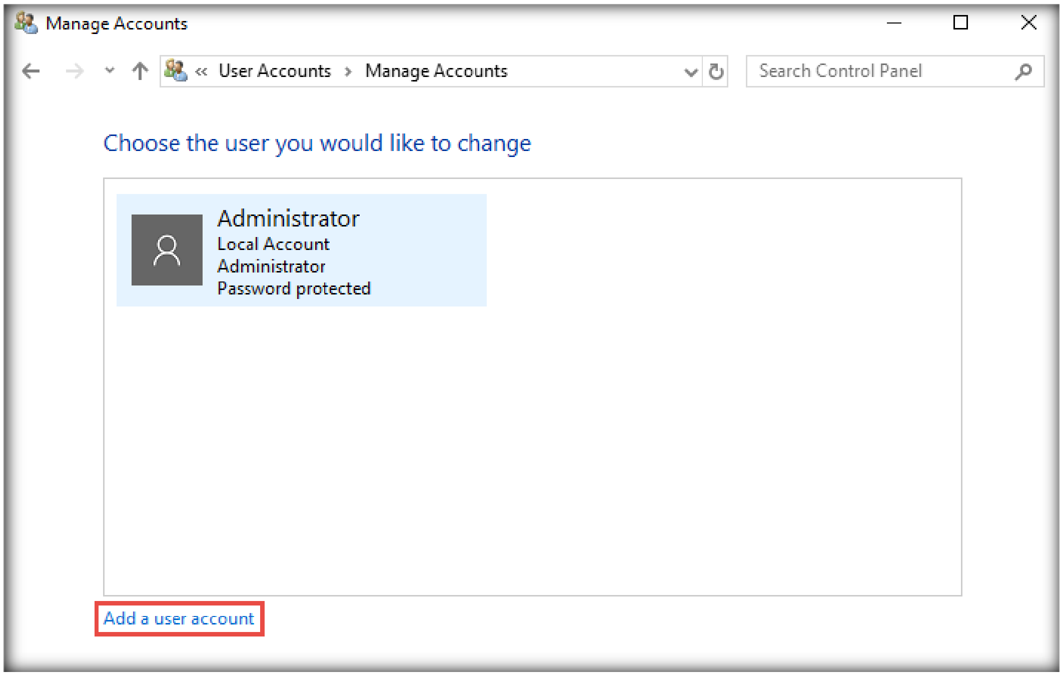
(iii) Username: **Shiela**; Password: **test**

## Creating User Accounts on Windows Server 2019

1. On the **Windows Server 2019** virtual machine, open **Control Panel** and click **Category** from the **View by:** field in the top-right corner of the window. Click **Change account type** under **User Accounts**.


Control Panel
Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
View event logs
Network and Internet
View network status and tasks
Hardware
View devices and printers
Add a device
Programs
Uninstall a program
Turn Windows features on or off
User Accounts
Change account type
Appearance and Personalization
Clock and Region
Set the time and date
Change date, time, or number formats
Ease of Access
Let Windows suggest settings
Optimize visual display

2. Click the **Add a user account** link in the **Manage Accounts** window.

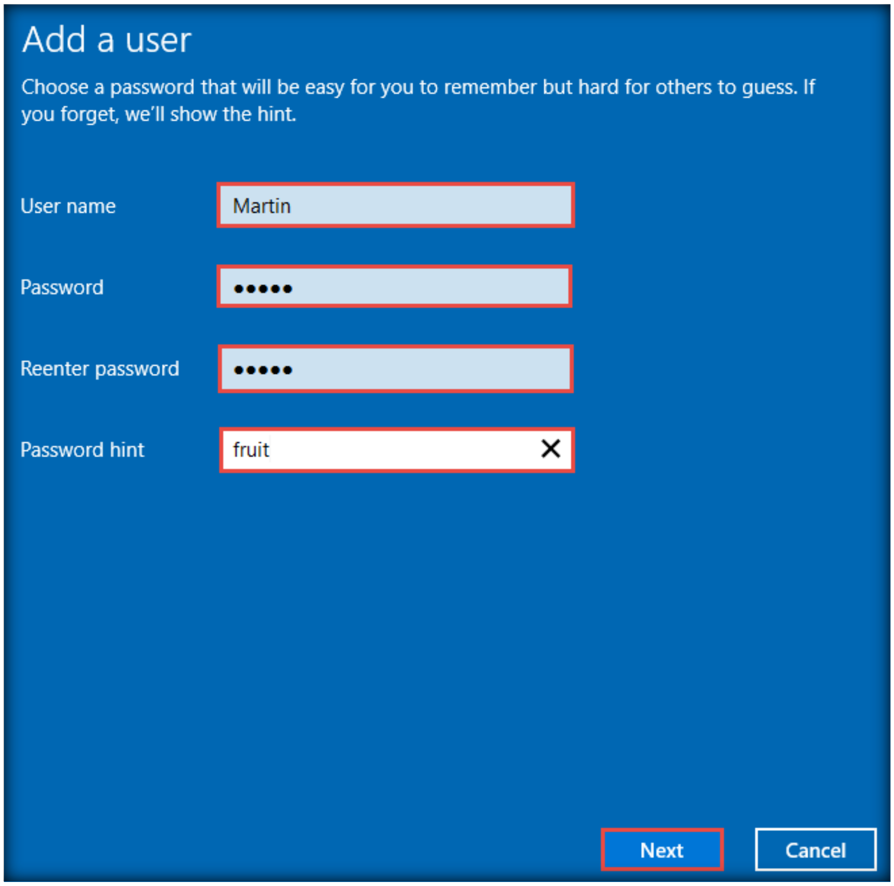


Manage Accounts
User Accounts › Manage Accounts
Search Control Panel
Add a user account

Choose the user you would like to change

Administrator
Local Account
Administrator
Password protected

3. The **Add a user** window appears; fill in the following details (Username: **Martin**; Password: **apple**), and click **Next**.



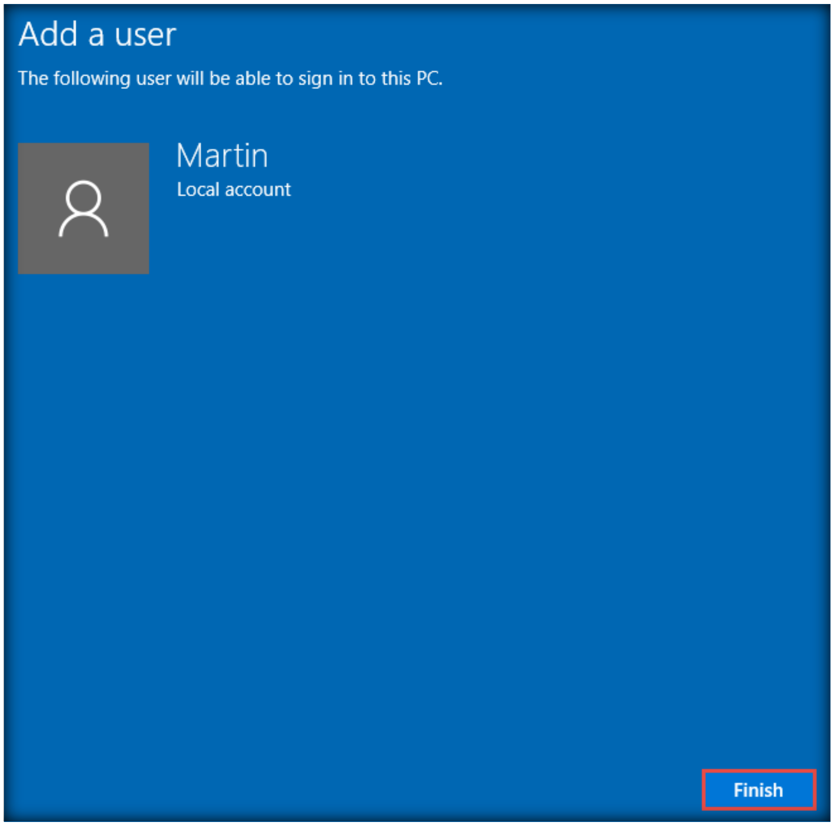
Next
Cancel

Add a user

Choose a password that will be easy for you to remember but hard for others to guess. If you forget, we'll show the hint.

User name: Martin
Password: •••••
Reenter password: •••••
Password hint: fruit

4. Click **Finish** after the user account is created.



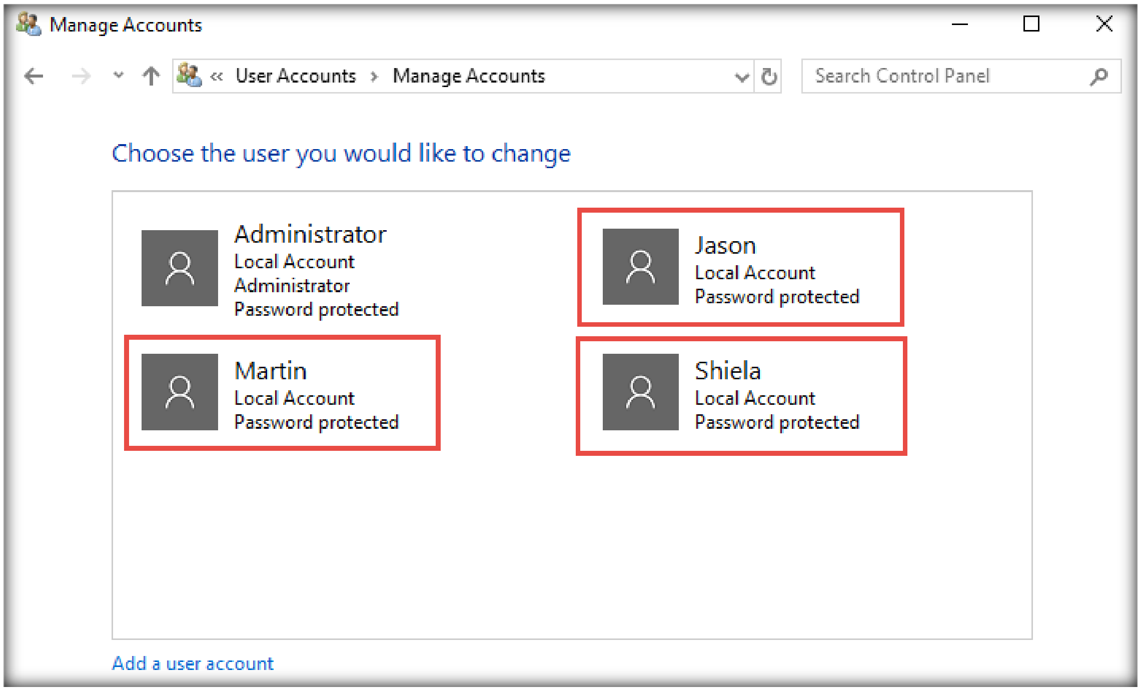
Add a user

The following user will be able to sign in to this PC.

Martin
Local account

5. Follow steps 2–4 to create the other users.

6. The screenshot below shows the user accounts created on the **Windows Server 2019** virtual machine.



Manage Accounts
User Accounts › Manage Accounts
Search Control Panel

Choose the user you would like to change

Administrator
Local Account
Administrator
Password protected

Jason
Local Account
Password protected

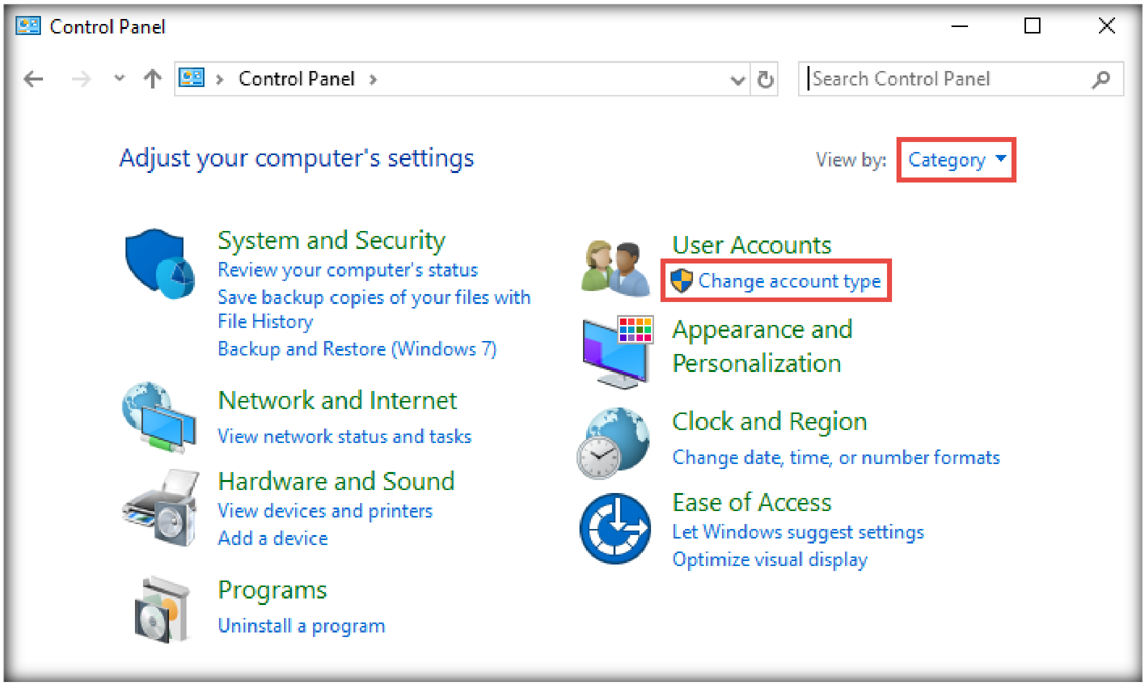
Martin
Local Account
Password protected

Shiela
Local Account
Password protected

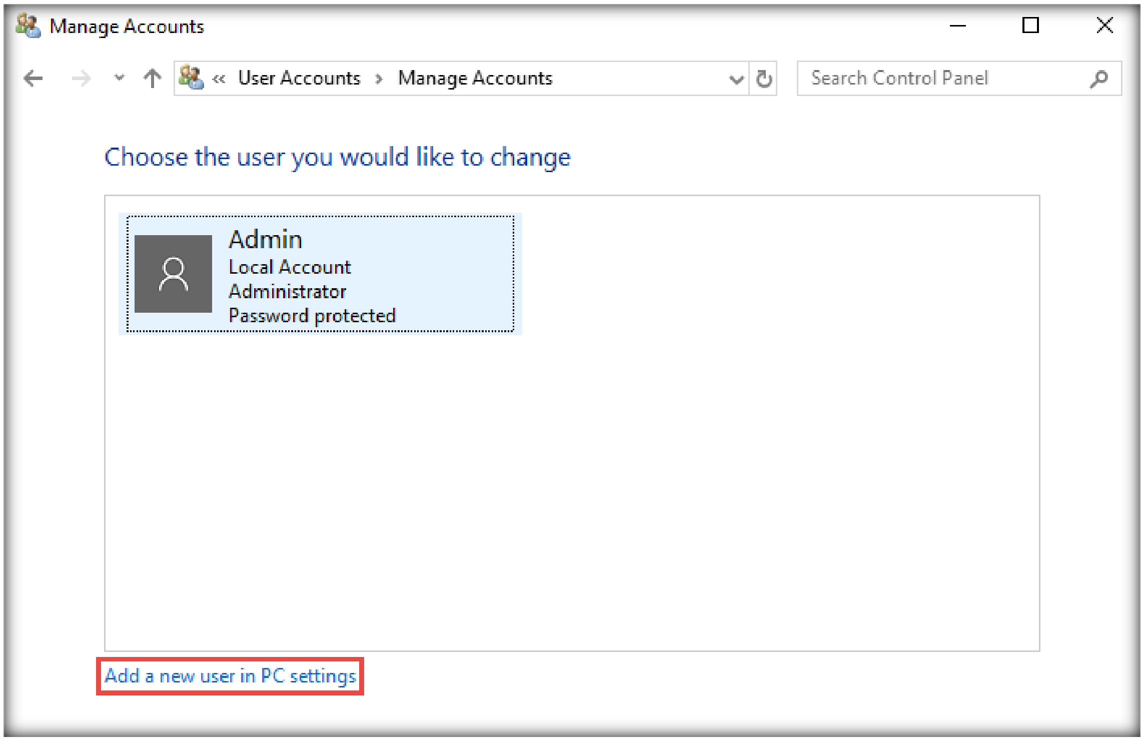
Add a user account

## Creating User Accounts in Windows 10

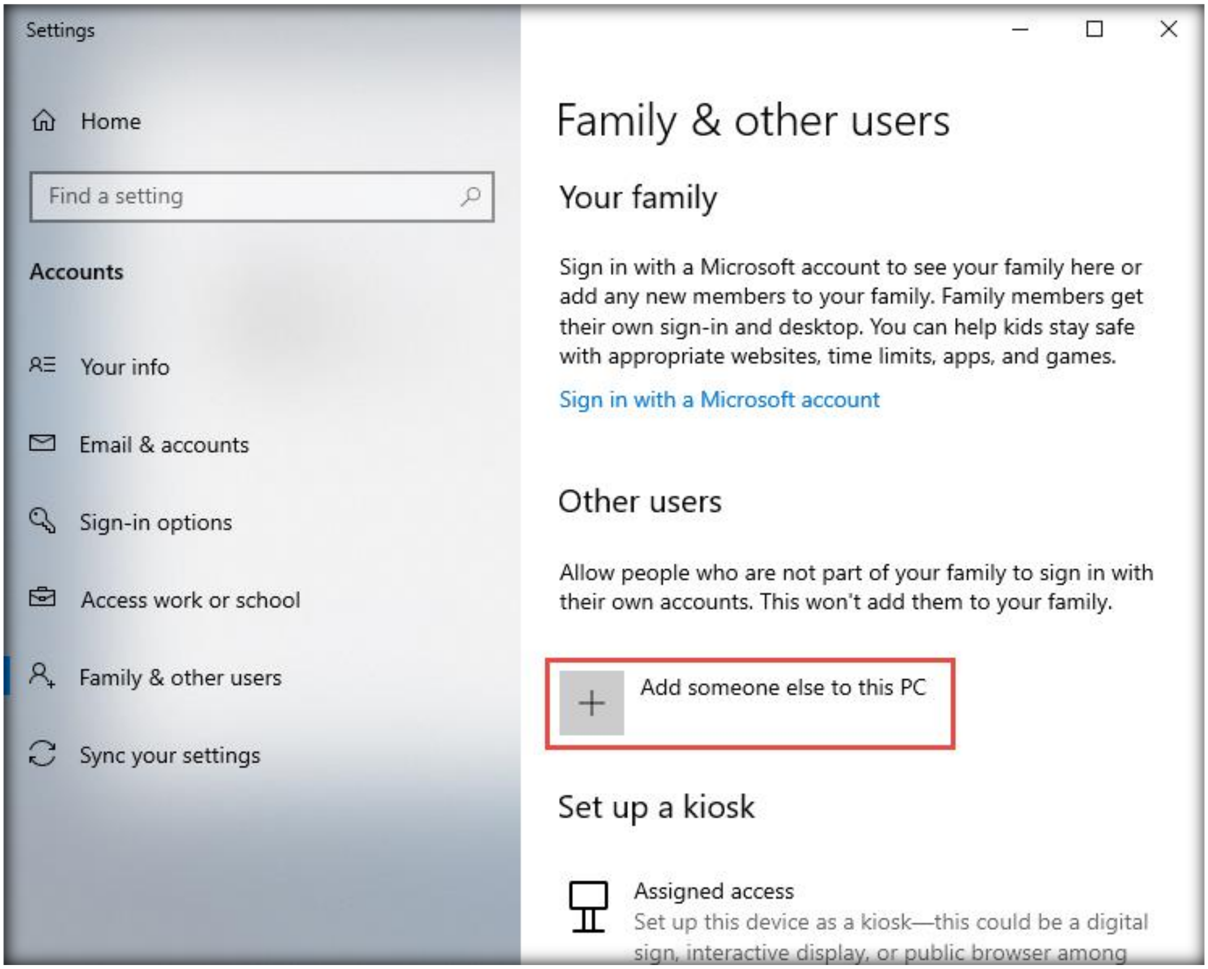
7. On the **Windows 10** virtual machine, open **Control Panel** and click **Category** from the **View by:** field in the top-right corner of the window. Click **Change account type** under **User Accounts**.


Control Panel
Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
Save backup copies of your files with File History
Backup and Restore (Windows 7)
Network and Internet
View network status and tasks
Hardware and Sound
View devices and printers
Add a device
Programs
Uninstall a program
User Accounts
Change account type
Appearance and Personalization
Clock and Region
Change date, time, or number formats
Ease of Access
Let Windows suggest settings
Optimize visual display

8. Click the **Add a new user in PC settings** link in the **Manage Accounts** window.


Manage Accounts
User Accounts
Manage Accounts
Search Control Panel
Choose the user you would like to change
Admin
Local Account
Administrator
Password protected
Add a new user in PC settings

9. The **Settings** window appears. Under **Family & other users**, click **Add someone else to this PC**.


Settings
Home
Find a setting
Accounts
Your info
Email & accounts
Sign-in options
Access work or school
Family & other users
Sync your settings

Family & other users

Your family

Sign in with a Microsoft account to see your family here or add any new members to your family. Family members get their own sign-in and desktop. You can help kids stay safe with appropriate websites, time limits, apps, and games.

Sign in with a Microsoft account

Other users

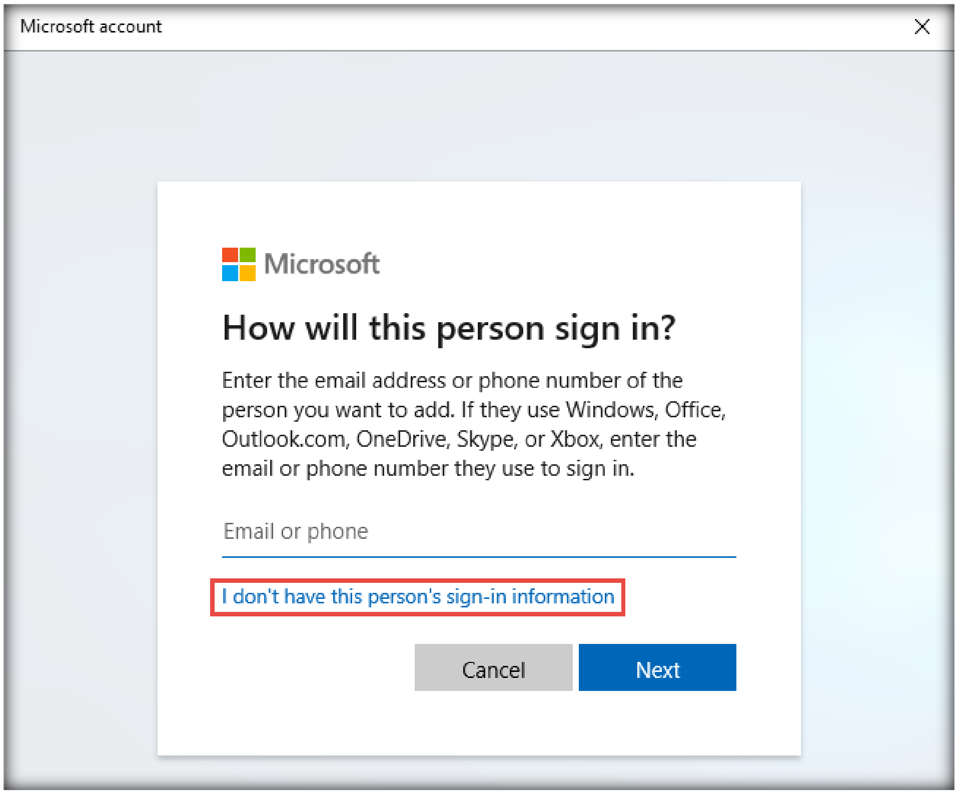
Allow people who are not part of your family to sign in with their own accounts. This won't add them to your family.

Add someone else to this PC

Set up a kiosk

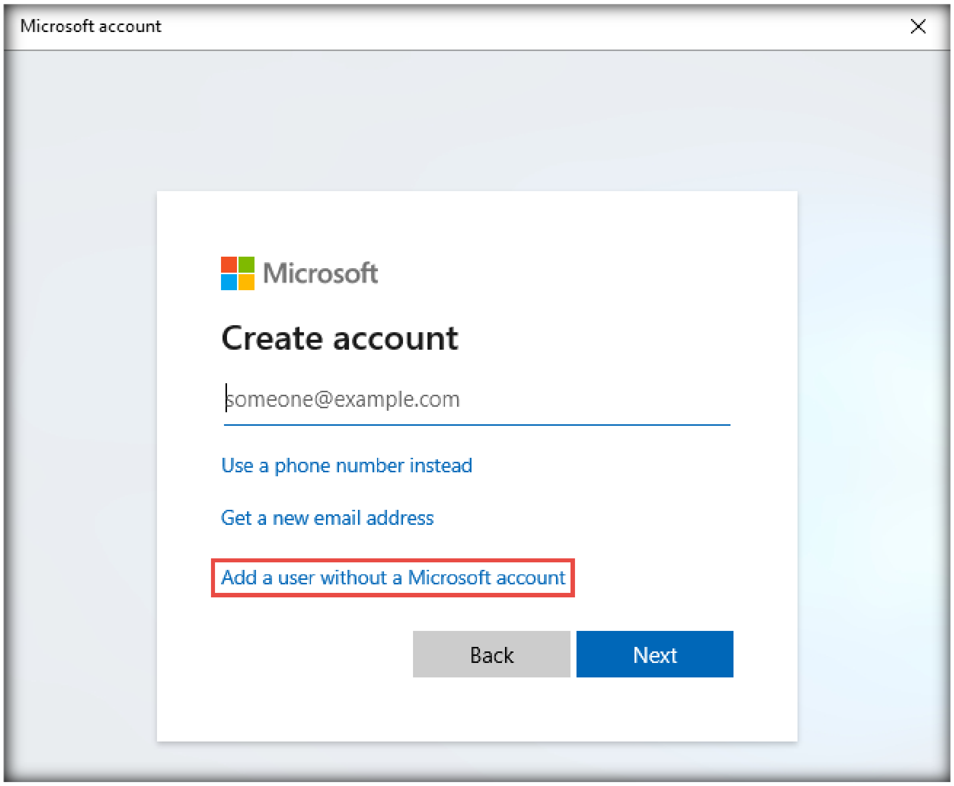
Assigned access
Set up this device as a kiosk—this could be a digital sign, interactive display, or public browser among

10. In the **Microsoft account** window, click the **I don't have this person's sign-in information** link.



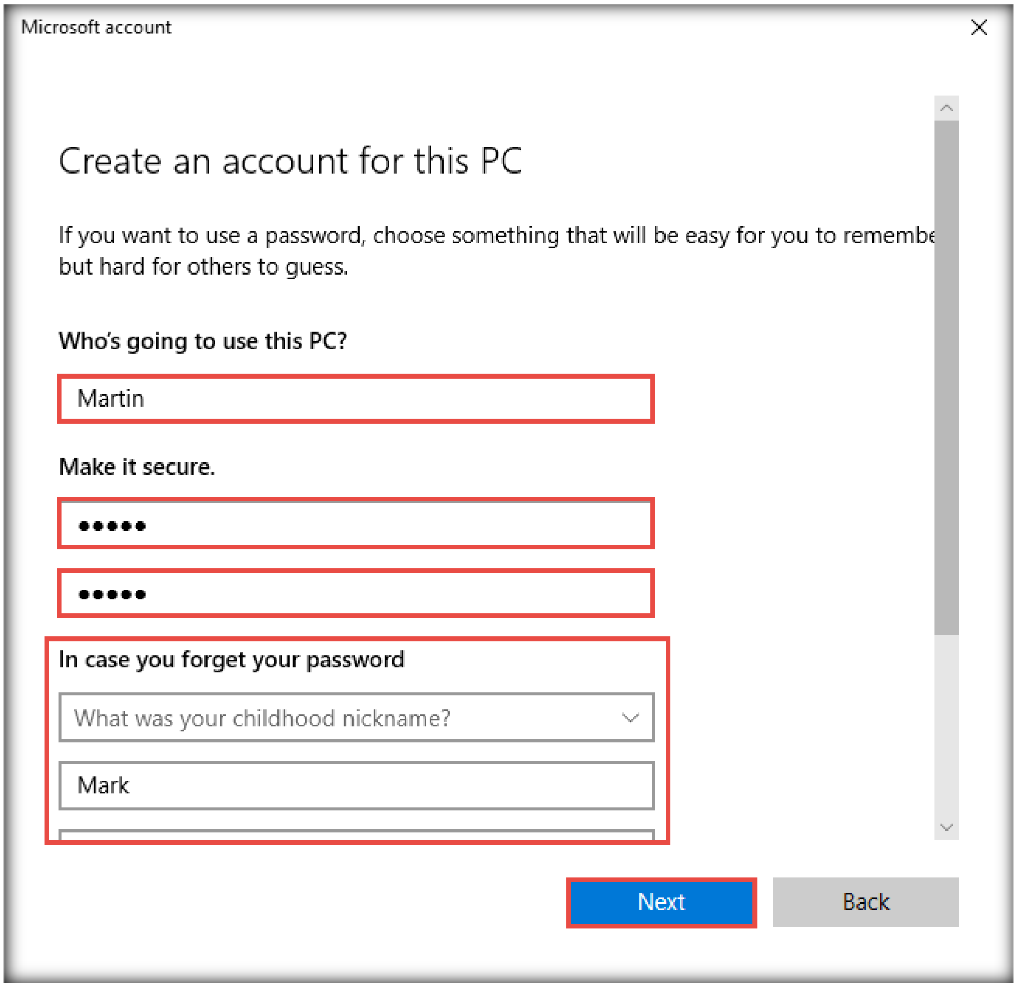
Microsoft account
Microsoft
How will this person sign in?
Enter the email address or phone number of the person you want to add. If they use Windows, Office, Outlook.com, OneDrive, Skype, or Xbox, enter the email or phone number they use to sign in.
Email or phone
I don't have this person's sign-in information
Cancel
Next

11. In the **Microsoft account** window, click the **Add a user without a Microsoft account** link.



Microsoft account
Microsoft
Create account
someone@example.com
Use a phone number instead
Get a new email address
Add a user without a Microsoft account
Back
Next

12. In the **Microsoft account** window, fill in the following details for **Who's going to use this PC?** (**Martin** Password: **apple**).
13. Answer the questions in the **In case you forget your password** section and click **Next**.



Create an account for this PC

If you want to use a password, choose something that will be easy for you to remembe but hard for others to guess.

Who's going to use this PC?

Martin

Make it secure.

•••••

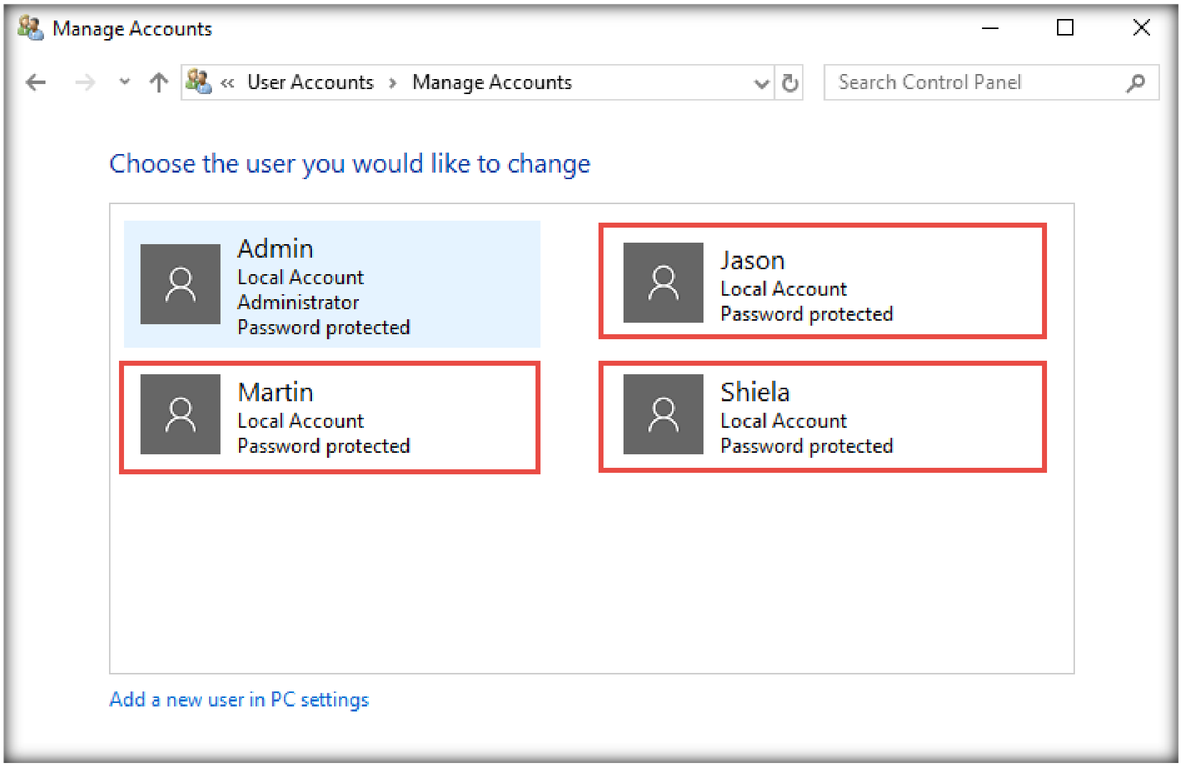
•••••

In case you forget your password

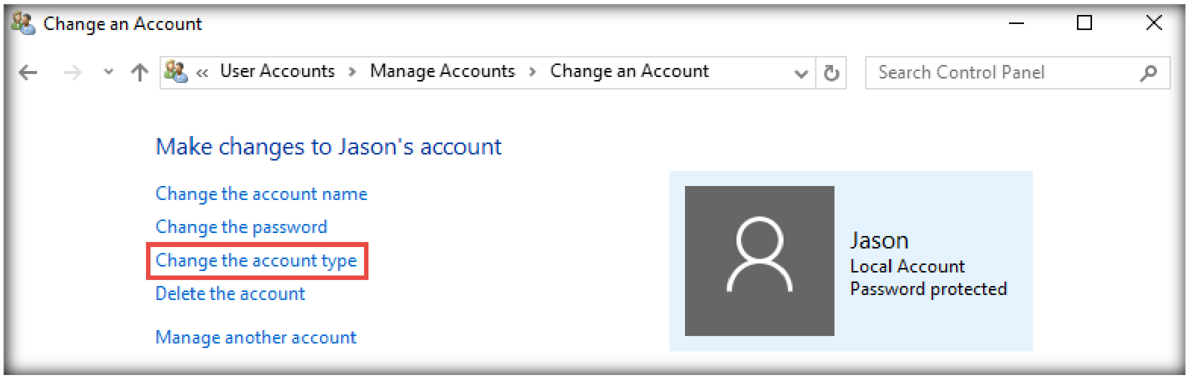
What was your childhood nickname?

Mark

14. Follow the same steps to create the other users.
15. The screenshot below shows the user accounts created on the **Windows 10** virtual machine.


Manage Accounts
« User Accounts › Manage Accounts
Search Control Panel
Choose the user you would like to change
Admin
Local Account
Administrator
Password protected
Jason
Local Account
Password protected
Martin
Local Account
Password protected
Shiela
Local Account
Password protected
Add a new user in PC settings

16. Now, click the **Jason** user account, the **Make changes to Jason's account** page appears. Click the **Change the account type** option.


Change an Account
« User Accounts › Manage Accounts › Change an Account
Search Control Panel
Make changes to Jason's account
Change the account name
Change the password
Change the account type
Delete the account
Manage another account
Jason
Local Account
Password protected

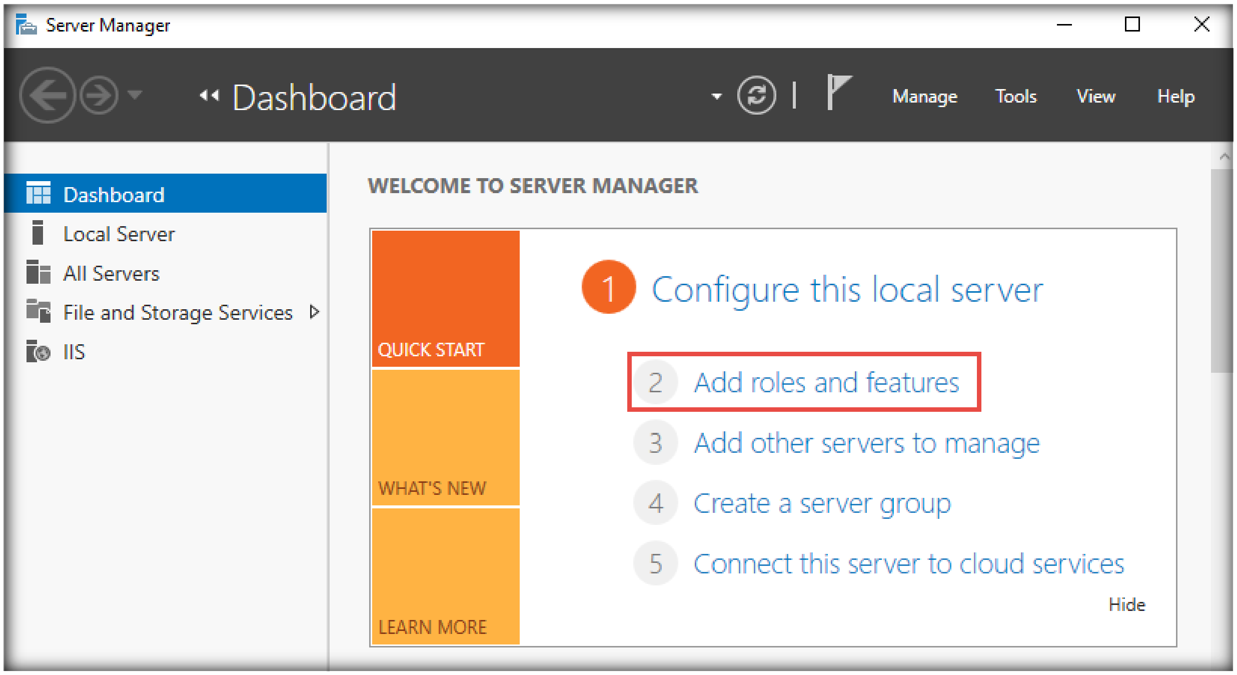
17. The **Choose a new account type for Jason** page appears; select the **Administrator** radio button and click **Change Account Type** button.
18. Close all windows.

[Back to Configuration Task Outline]

# CT#29: Install Active Directory and Create User Accounts on the Windows Server 2016 Virtual Machine

## Install Active Directory in Windows Server 2016 Virtual Machine

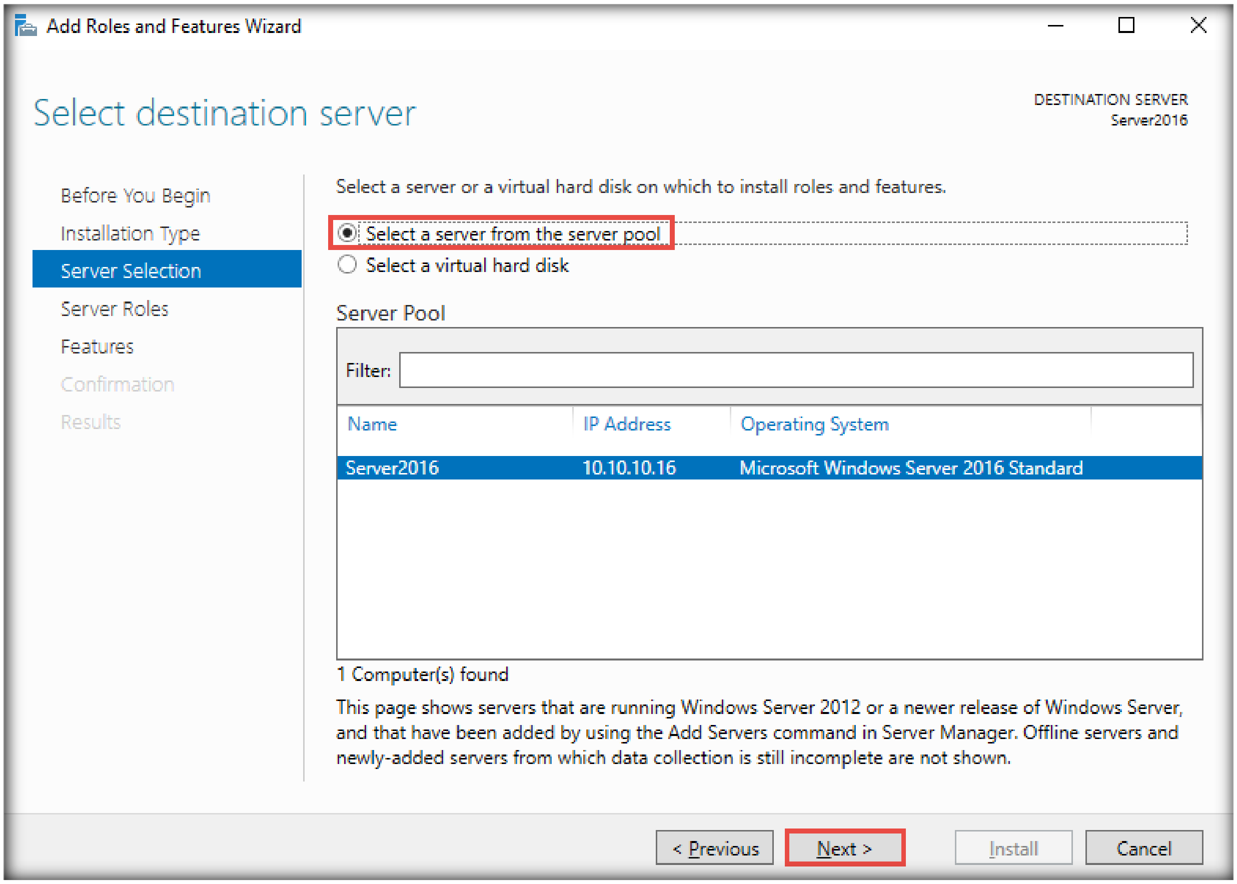
1. Log in to the **Windows Server 2016** virtual machine with the credentials **Administrator** and **Pa$$w0rd**.
2. Open the **Server Manager** and click the **Add roles and features** link from the **Server Manager Dashboard**.


Server Manager
Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
IIS
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
Hide

3. The **Before you begin** wizard appears. Click **Next** to continue.
4. The **Select installation type** section appears; leave the default options and click **Next**.

   **Note**: Ensure that the **Role-based or feature-based installation** radio-button is selected.

5. The **Select destination server** section appears. Choose the **Select a server from the server pool** radio button and click **Next**.



Add Roles and Features Wizard
Select destination server
DESTINATION SERVER
Server2016
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results

Select a server or a virtual hard disk on which to install roles and features.

● Select a server from the server pool

○ Select a virtual hard disk

Server Pool

Filter:

| Name | IP Address | Operating System |
|---|---|---|
| Server2016 | 10.10.10.16 | Microsoft Windows Server 2016 Standard |

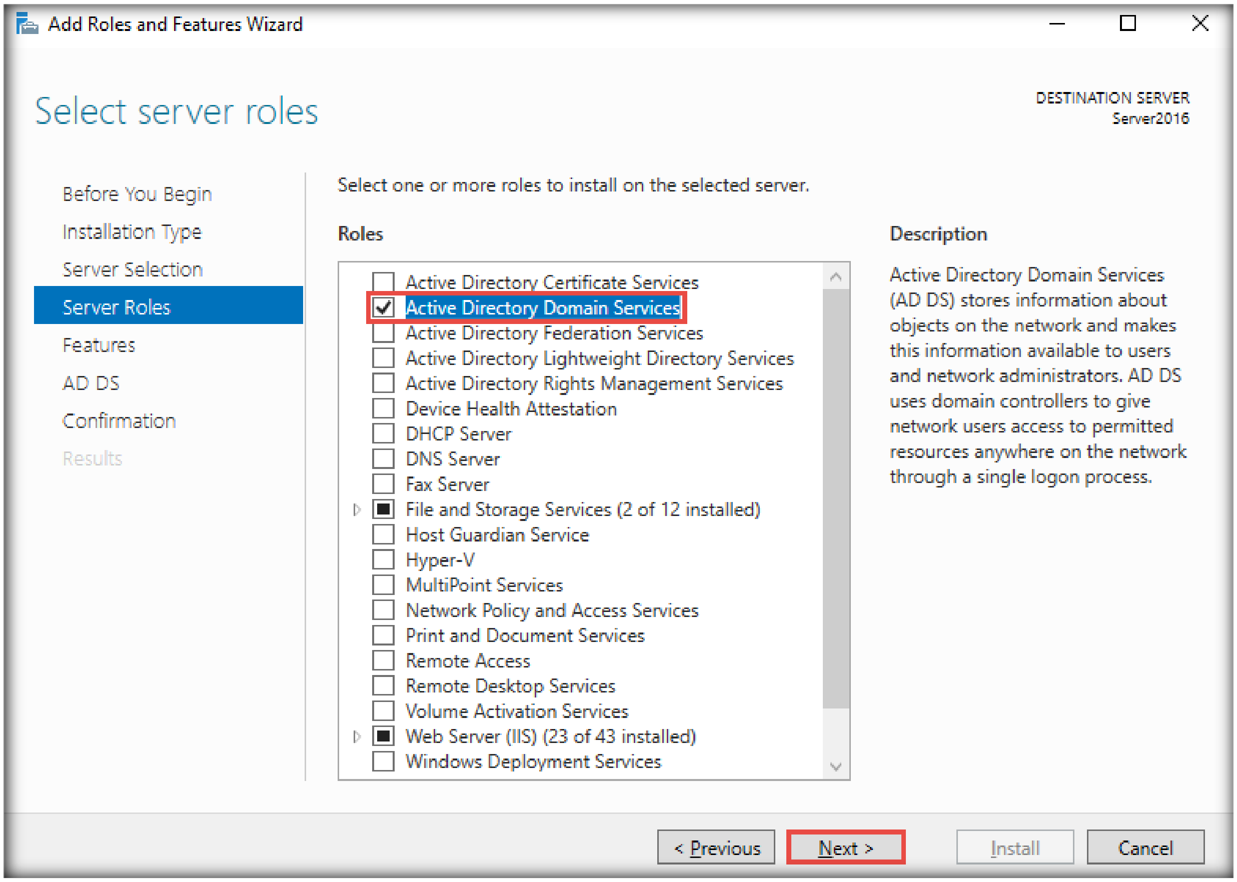
1 Computer(s) found

This page shows servers that are running Windows Server 2012 or a newer release of Windows Server, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

< Previous
Next >
Install
Cancel

6. Check **Active Directory Domain Services** from the **Roles** section in the **Select Server Roles** wizard and click **Next**.

   **Note**: If the **Add Roles and Features Wizard** pop-up window appears, click **Add Features**.


Add Roles and Features Wizard
DESTINATION SERVER
Server2016
Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results
< Previous
Next >
Install
Cancel

Select server roles

Select one or more roles to install on the selected server.

Roles

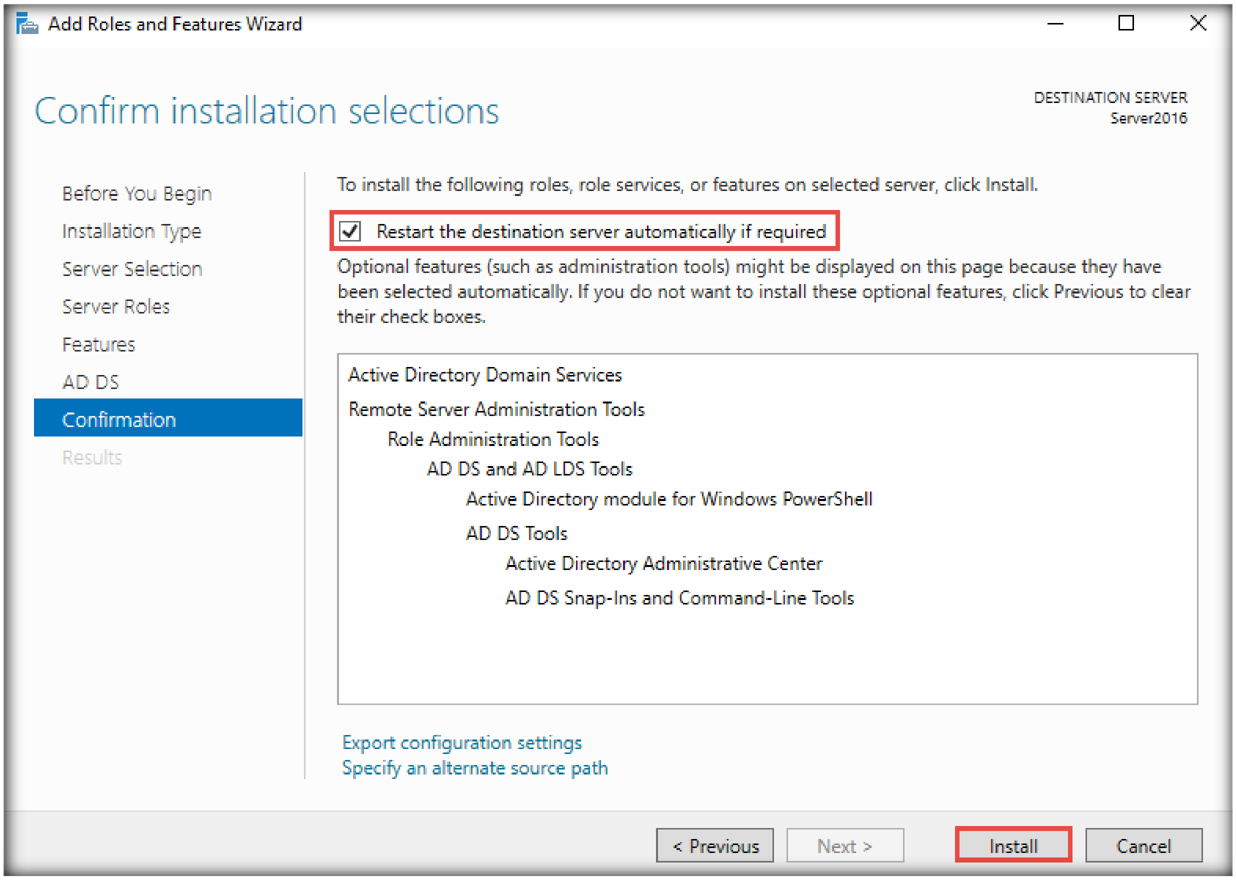
- ☐ Active Directory Certificate Services
- ☑ Active Directory Domain Services
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Device Health Attestation
- ☐ DHCP Server
- ☐ DNS Server
- ☐ Fax Server
- ■ File and Storage Services (2 of 12 installed)
- ☐ Host Guardian Service
- ☐ Hyper-V
- ☐ MultiPoint Services
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services
- ☐ Volume Activation Services
- ■ Web Server (IIS) (23 of 43 installed)
- ☐ Windows Deployment Services

Description

Active Directory Domain Services (AD DS) stores information about objects on the network and makes this information available to users and network administrators. AD DS uses domain controllers to give network users access to permitted resources anywhere on the network through a single logon process.

7. In the **Select features** section, click **Next** to continue.
8. The **Active Directory Domain Services** section appears; click **Next** to continue.
9. The **Confirm installation selections** section appears; check the **Restart the destination server automatically if required** option and click **Install**.

   **Note**: If the **Add Roles and Features Wizard** pop-up window appears, click **Yes**.


Add Roles and Features Wizard
Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results
Export configuration settings
Specify an alternate source path
< Previous
Next >
Install
Cancel

Confirm installation selections

DESTINATION SERVER
Server2016

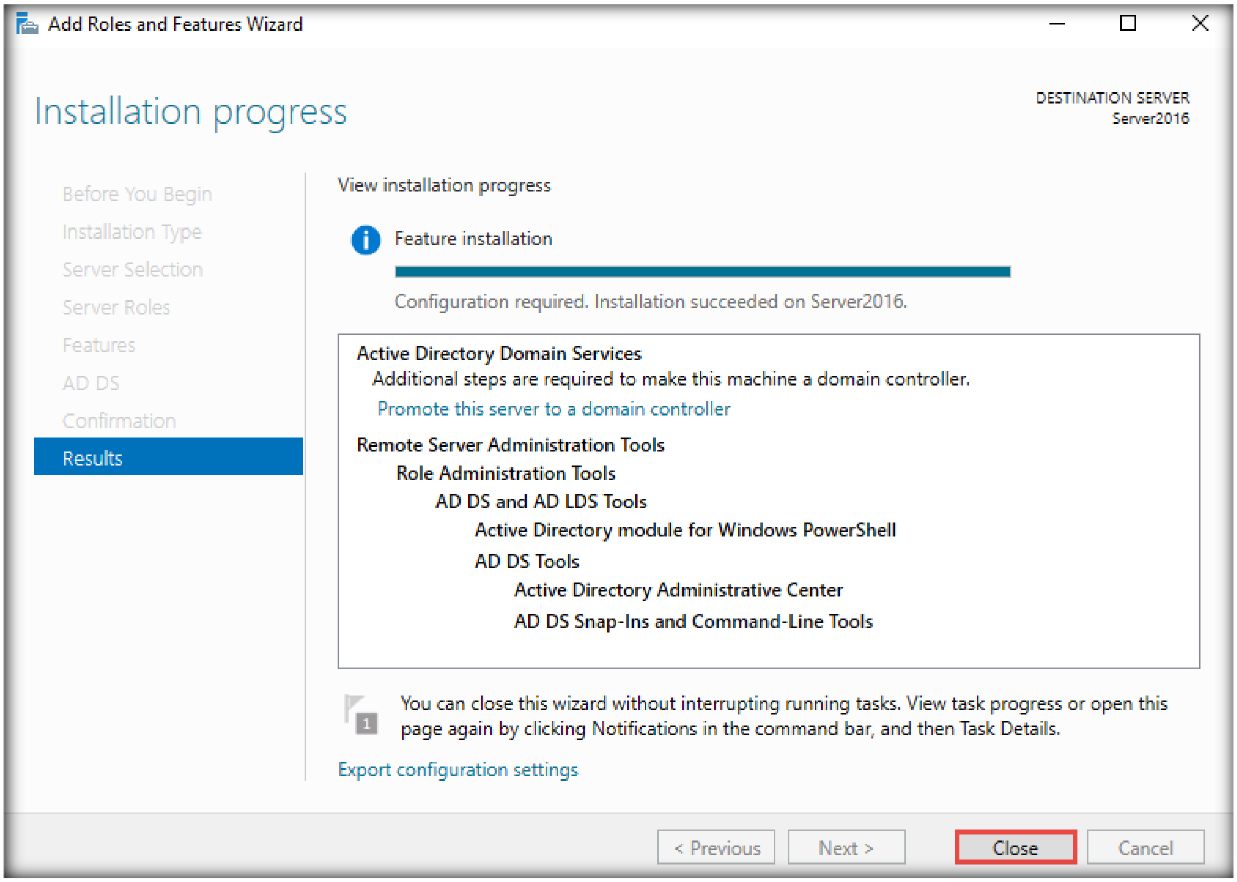
To install the following roles, role services, or features on selected server, click Install.

☑ Restart the destination server automatically if required

Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.

- Active Directory Domain Services
- Remote Server Administration Tools
  - Role Administration Tools
    - AD DS and AD LDS Tools
      - Active Directory module for Windows PowerShell
      - AD DS Tools
        - Active Directory Administrative Center
        - AD DS Snap-Ins and Command-Line Tools

10. Once the installation has finished, click the **Close** button in the **Add Roles and Features Wizard** window.



Add Roles and Features Wizard
Installation progress
DESTINATION SERVER
Server2016
Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results
Export configuration settings
< Previous
Next >
Close
Cancel

View installation progress

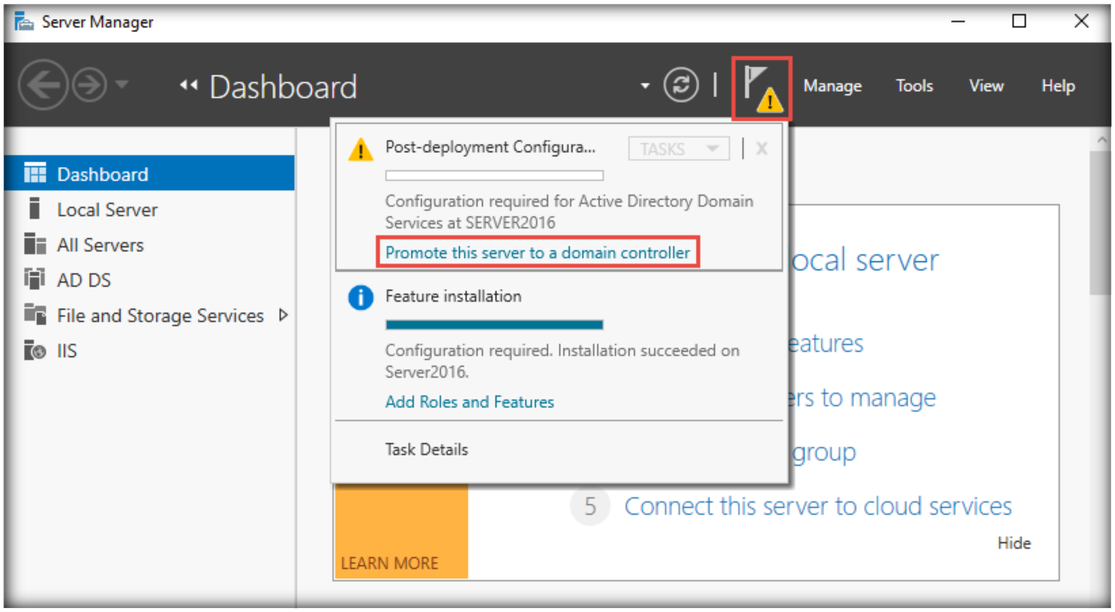
Feature installation

Configuration required. Installation succeeded on Server2016.

Active Directory Domain Services
Additional steps are required to make this machine a domain controller.
Promote this server to a domain controller
Remote Server Administration Tools
Role Administration Tools
AD DS and AD LDS Tools
Active Directory module for Windows PowerShell
AD DS Tools
Active Directory Administrative Center
AD DS Snap-Ins and Command-Line Tools

You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.

11. In the **Server Manager** window under **Dashboard**, click the **Flag** (⚠) icon and click the **Promote this server to a domain controller** link, as shown in the screenshot.

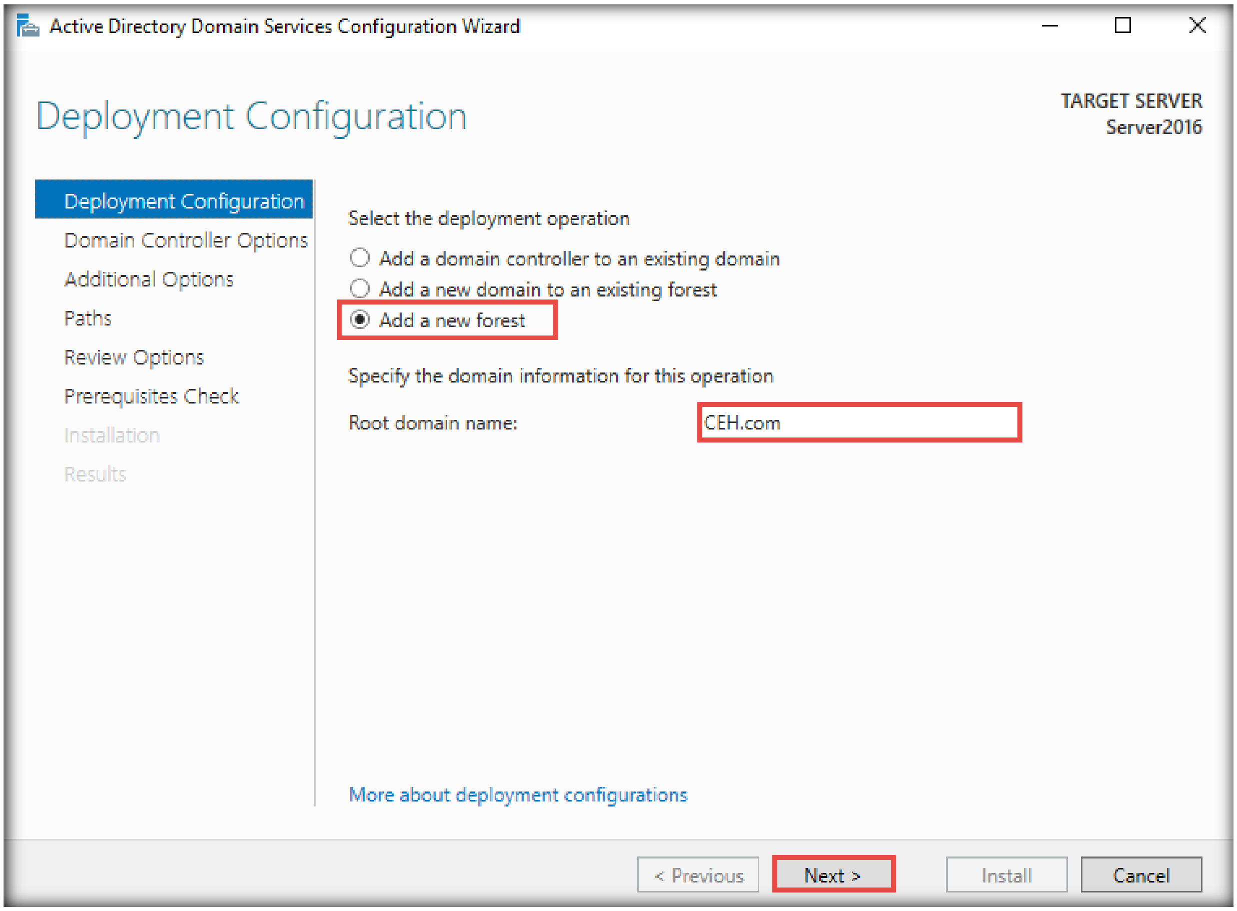


Server Manager
Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
AD DS
File and Storage Services
IIS
TASKS
Post-deployment Configura...
Promote this server to a domain controller
Feature installation
Add Roles and Features
Task Details
ocal server
eatures
rs to manage
group
5 Connect this server to cloud services
Hide
LEARN MORE

Configuration required for Active Directory Domain Services at SERVER2016

Configuration required. Installation succeeded on Server2016.

12. The **Active Directory Domain Services Configuration Wizard** window appears. In the **Deployment Configuration** section, select the **Add a new forest** radio button and type **CEH.com** in the **Root domain name** field; click **Next**.


Active Directory Domain Services Configuration Wizard
Deployment Configuration
TARGET SERVER
Server2016
Deployment Configuration
Domain Controller Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
More about deployment configurations
< Previous
Next >
Install
Cancel

Select the deployment operation

○ Add a domain controller to an existing domain

○ Add a new domain to an existing forest

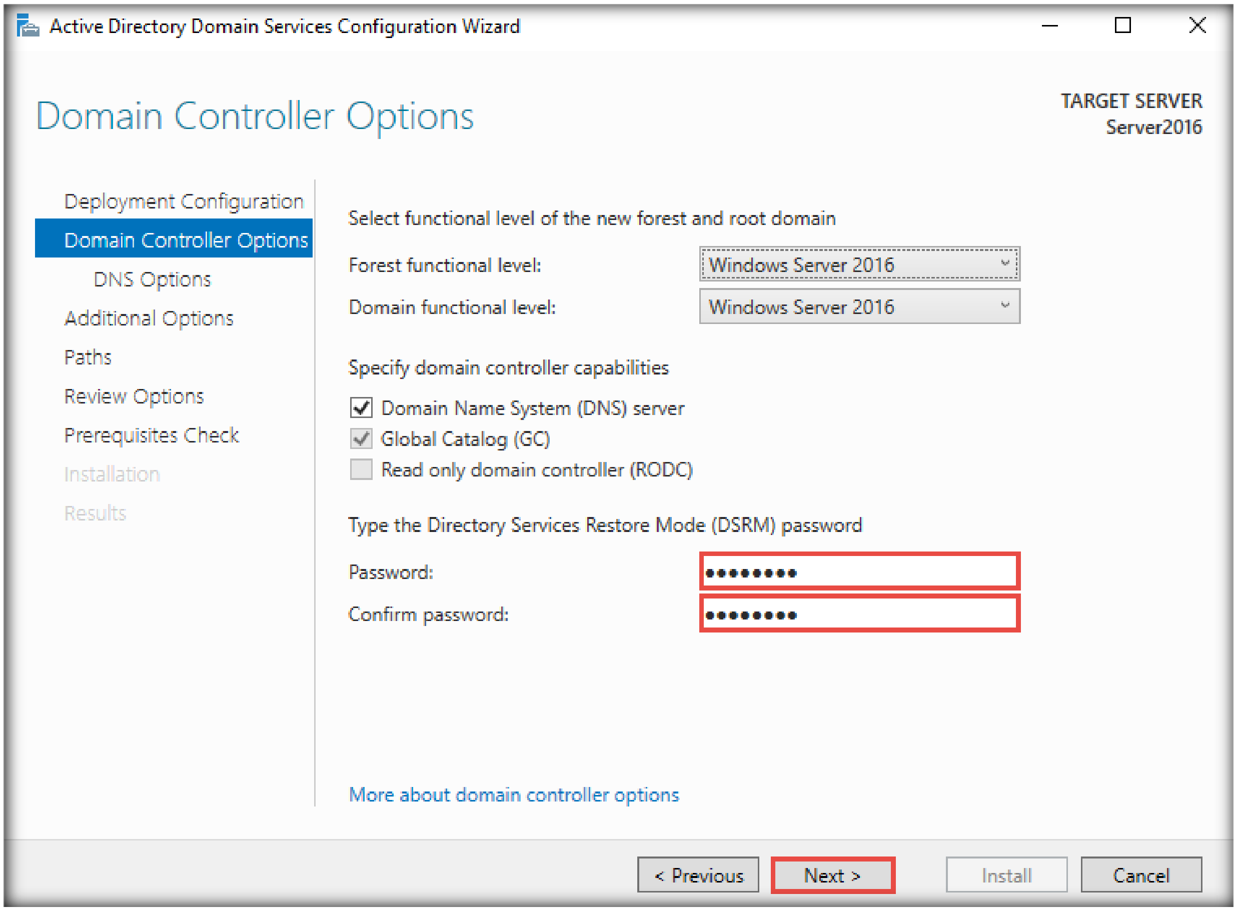
● Add a new forest

Specify the domain information for this operation

Root domain name: CEH.com

13. In the **Domain Controller Options** section, enter the password as **Pa$$w0rd** in the **Password** field and retype the same password in the **Confirm password** field to confirm it. After typing, click **Next**.

    **Note**: Wait until **Domain Controller Options** loads. This may take some time.


Active Directory Domain Services Configuration Wizard
Domain Controller Options
TARGET SERVER
Server2016
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
More about domain controller options
< Previous
Next >
Install
Cancel

Select functional level of the new forest and root domain

Forest functional level: Windows Server 2016

Domain functional level: Windows Server 2016

Specify domain controller capabilities

☑ Domain Name System (DNS) server

☑ Global Catalog (GC)

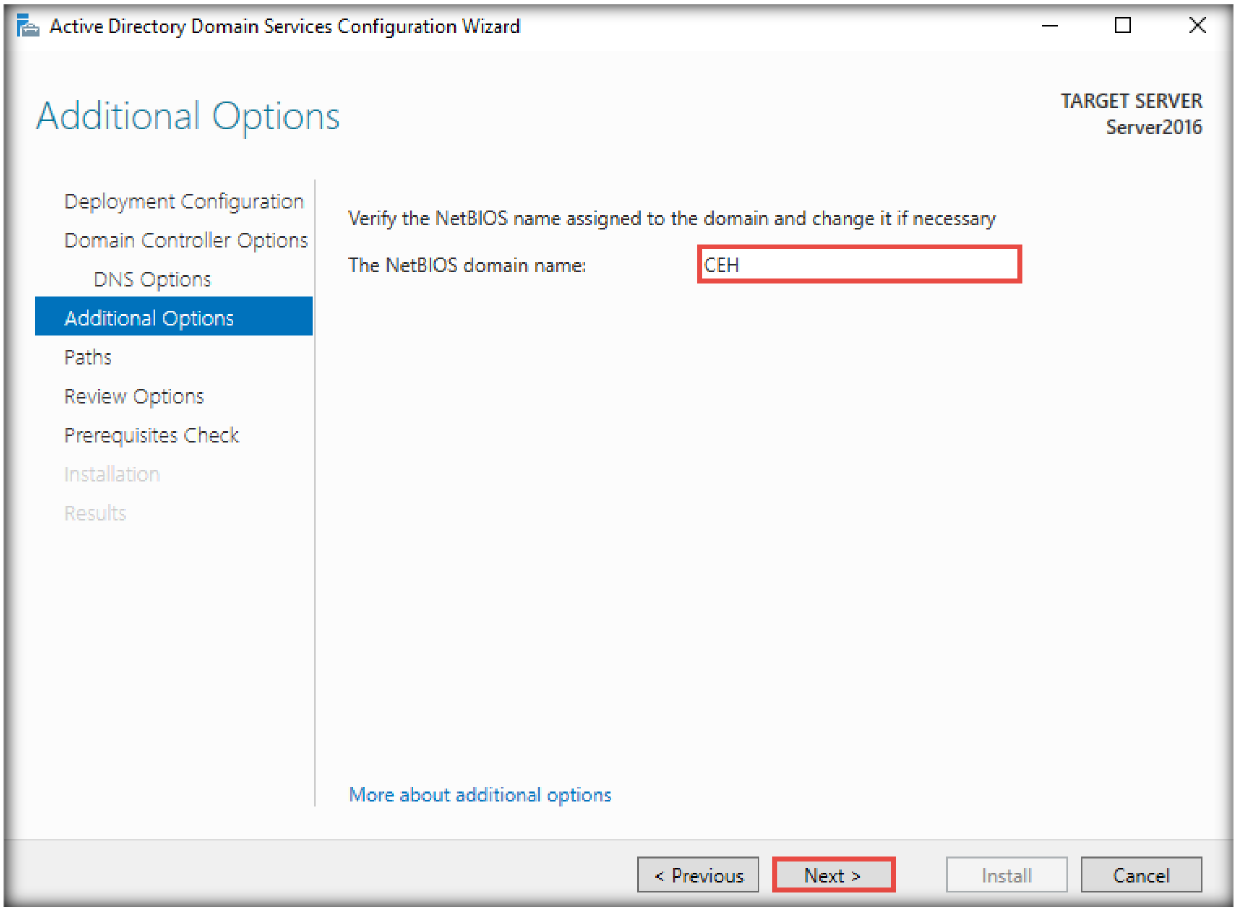
☐ Read only domain controller (RODC)

Type the Directory Services Restore Mode (DSRM) password

Password: ••••••••

Confirm password: ••••••••

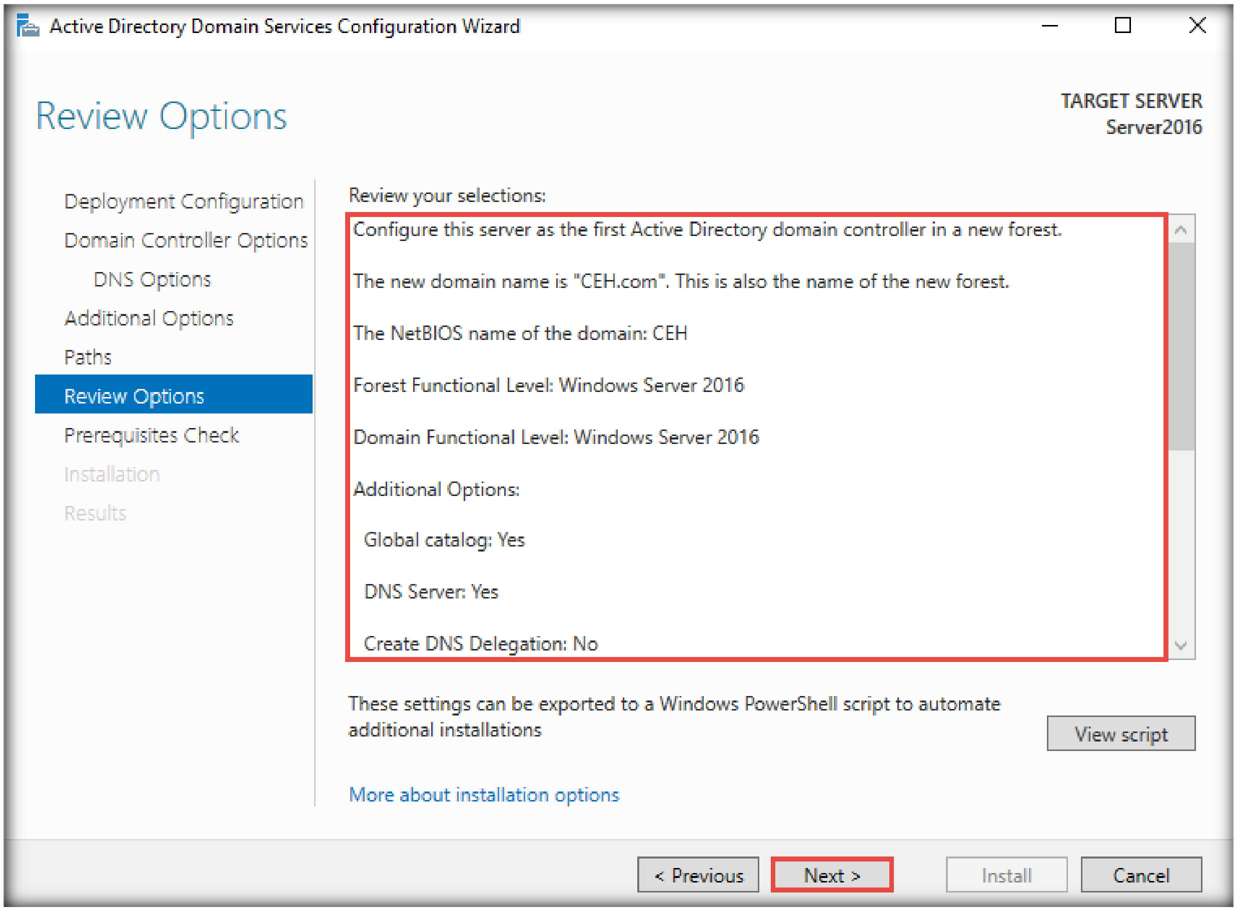
14. The **DNS Options** section appears. Ignore any alerts and click **Next**.
15. The **Additional Options** section appears; verify that the NetBIOS domain name is **CEH** and click **Next**.


Active Directory Domain Services Configuration Wizard
Additional Options
TARGET SERVER
Server2016
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
More about additional options
< Previous
Next >
Install
Cancel

Verify the NetBIOS name assigned to the domain and change it if necessary

The NetBIOS domain name: CEH

16. In the **Paths** section, click **Next**.
17. The **Review Options** section appears; review your selection, and click **Next**.


Active Directory Domain Services Configuration Wizard
Review Options
TARGET SERVER
Server2016
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
View script
More about installation options
< Previous
Next >
Install
Cancel

Review your selections:

Configure this server as the first Active Directory domain controller in a new forest.

The new domain name is "CEH.com". This is also the name of the new forest.

The NetBIOS name of the domain: CEH

Forest Functional Level: Windows Server 2016

Domain Functional Level: Windows Server 2016

Additional Options:

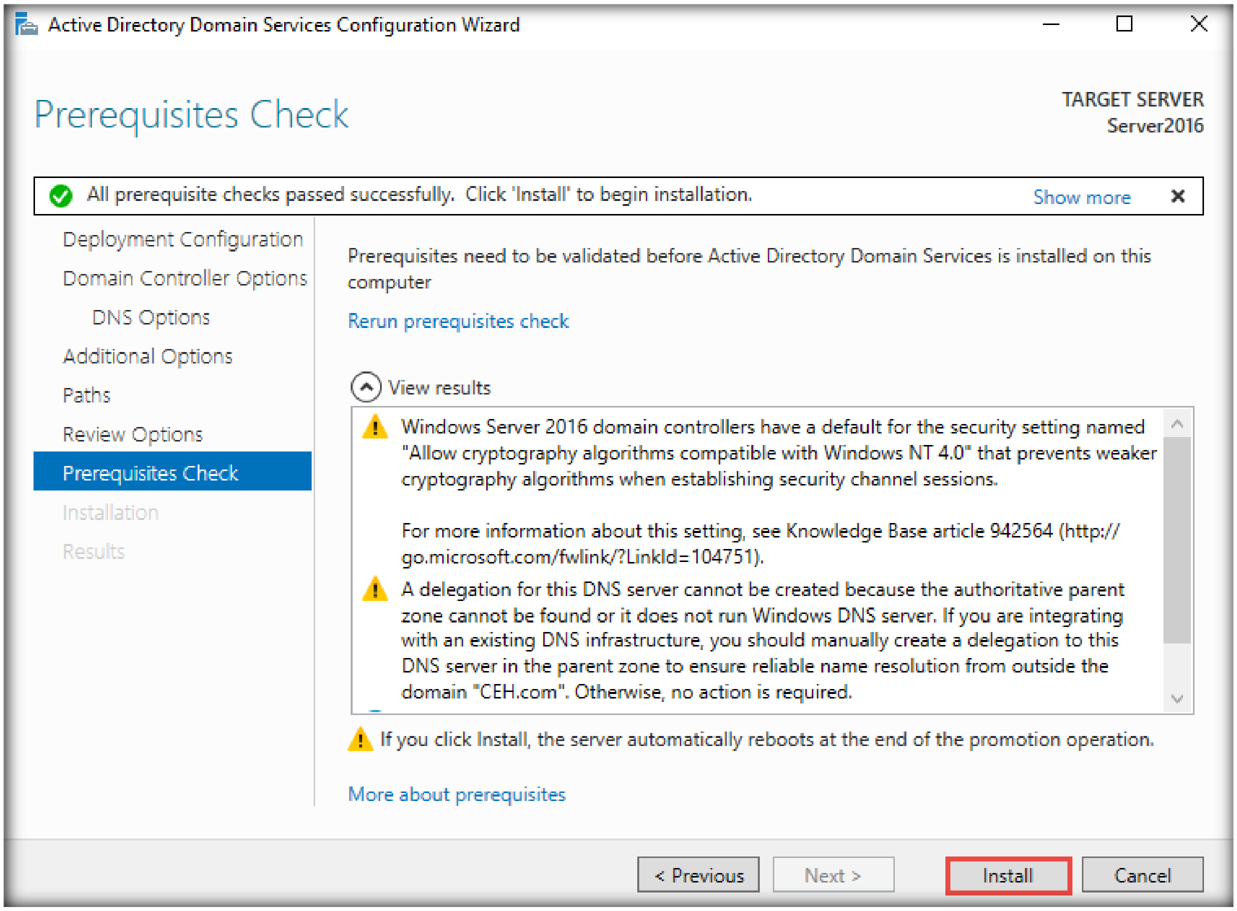
Global catalog: Yes

DNS Server: Yes

Create DNS Delegation: No

These settings can be exported to a Windows PowerShell script to automate additional installations

18. Wait until the process finishes, and then click **Install** in the **Prerequisites Check** section.



Active Directory Domain Services Configuration Wizard
Prerequisites Check
TARGET SERVER
Server2016
Show more
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
Rerun prerequisites check
View results
More about prerequisites
< Previous
Next >
Install
Cancel

All prerequisite checks passed successfully. Click 'Install' to begin installation.

Prerequisites need to be validated before Active Directory Domain Services is installed on this computer

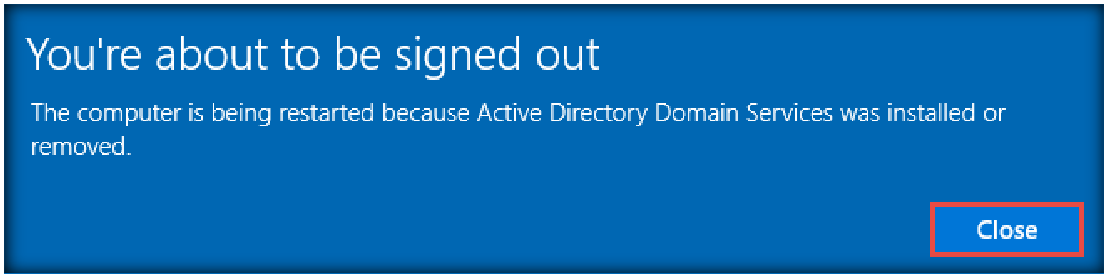
Windows Server 2016 domain controllers have a default for the security setting named "Allow cryptography algorithms compatible with Windows NT 4.0" that prevents weaker cryptography algorithms when establishing security channel sessions.

For more information about this setting, see Knowledge Base article 942564 (http://go.microsoft.com/fwlink/?LinkId=104751).

A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found or it does not run Windows DNS server. If you are integrating with an existing DNS infrastructure, you should manually create a delegation to this DNS server in the parent zone to ensure reliable name resolution from outside the domain "CEH.com". Otherwise, no action is required.

If you click Install, the server automatically reboots at the end of the promotion operation.

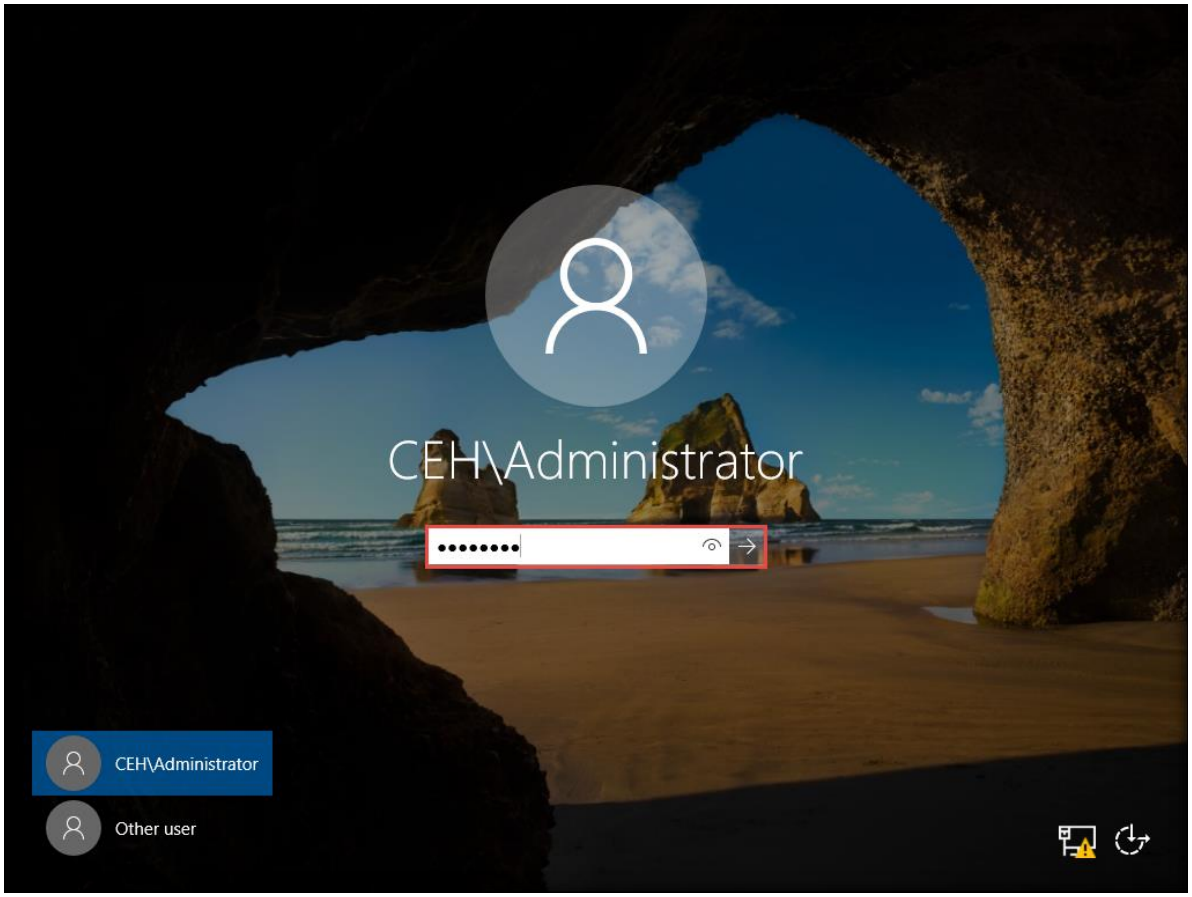
19. The **You're about to be signed out** pop-up window appears; click **Close**.



You're about to be signed out

The computer is being restarted because Active Directory Domain Services was installed or removed.

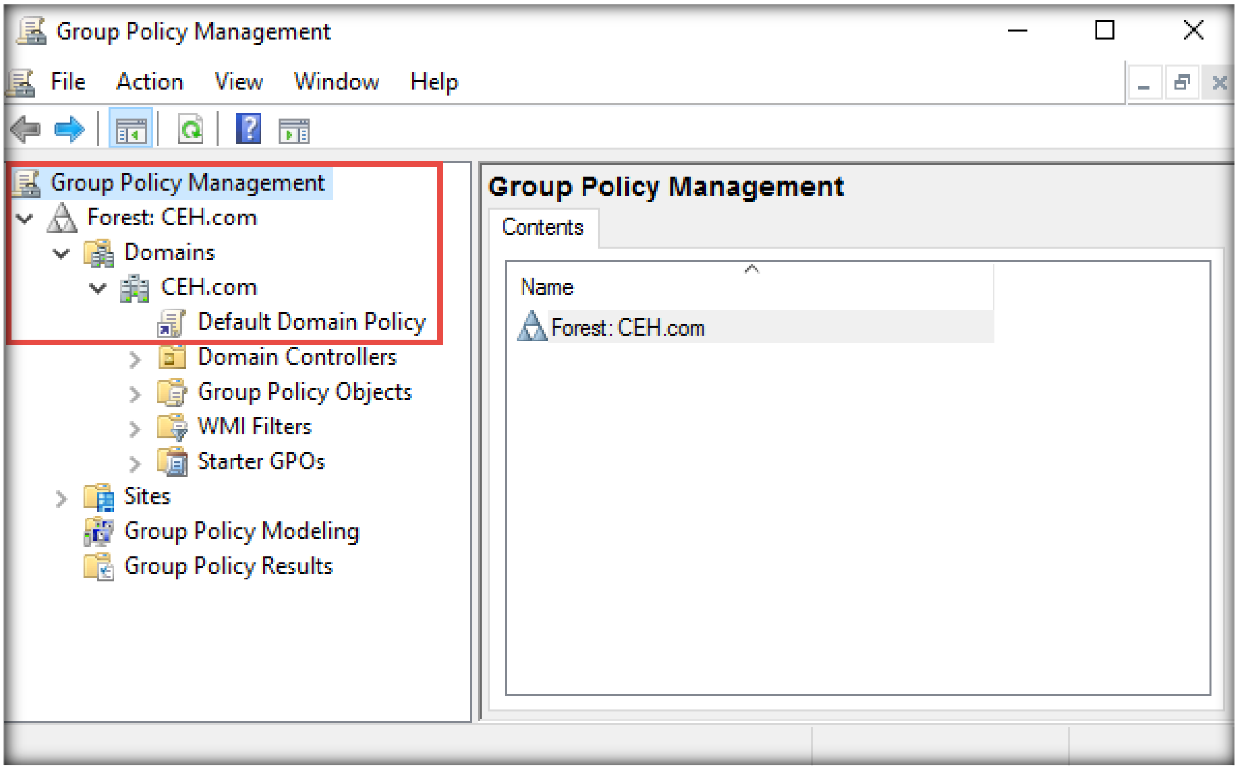
20. Once the machine has restarted, the lock screen appears. Press the **Send Ctrl+Alt+Delete to this virtual machine** ( ⎘ ) icon from the menu bar. By default, the **CEH\Administrator** account is selected. Log in with **Pa$$w0rd** as the password.


CEH\Administrator
••••••••
CEH\Administrator
Other user

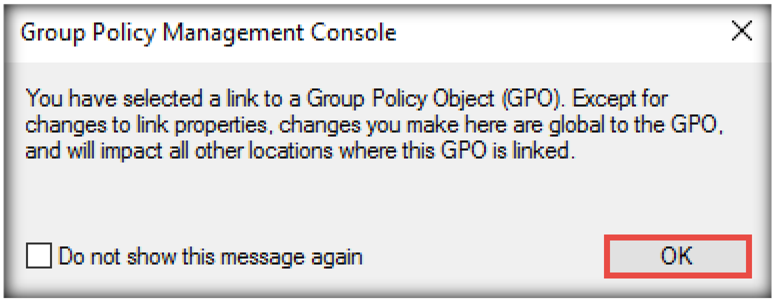
## Configure Group Policy Management

21. Click the **Windows** icon in the lower-left corner of the screen. The **Start** menu appears; click **Windows Administrative Tools** → **Group Policy Management**.

22. The **Group Policy Management** window appears. Expand **Forest: CEH.com** → **Domains** → **CEH.com** and select **Default Domain Policy**.


Group Policy Management
File
Action
View
Window
Help
Group Policy Management
Forest: CEH.com
Domains
CEH.com
Default Domain Policy
Domain Controllers
Group Policy Objects
WMI Filters
Starter GPOs
Sites
Group Policy Modeling
Group Policy Results
Group Policy Management
Contents
Name
Forest: CEH.com

23. The **Group Policy Management Console** dialog box appears; click **OK**.


Group Policy Management Console

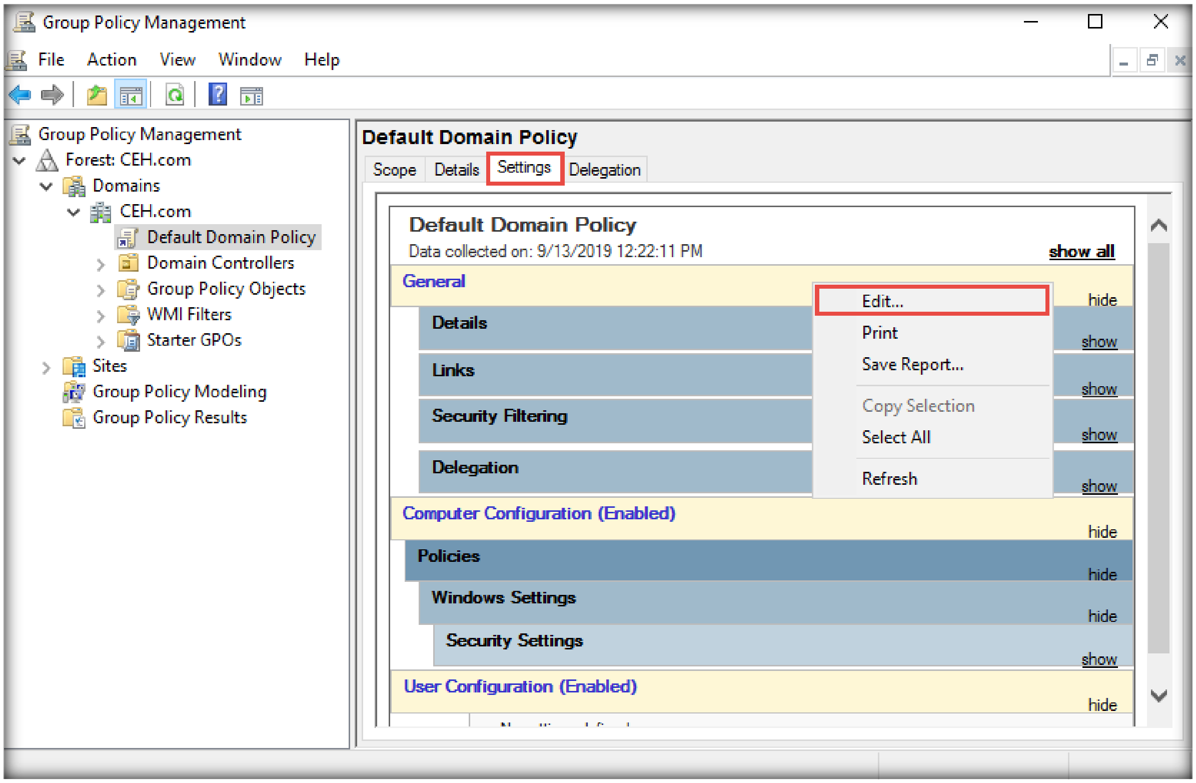
You have selected a link to a Group Policy Object (GPO). Except for changes to link properties, changes you make here are global to the GPO, and will impact all other locations where this GPO is linked.

☐ Do not show this message again

OK

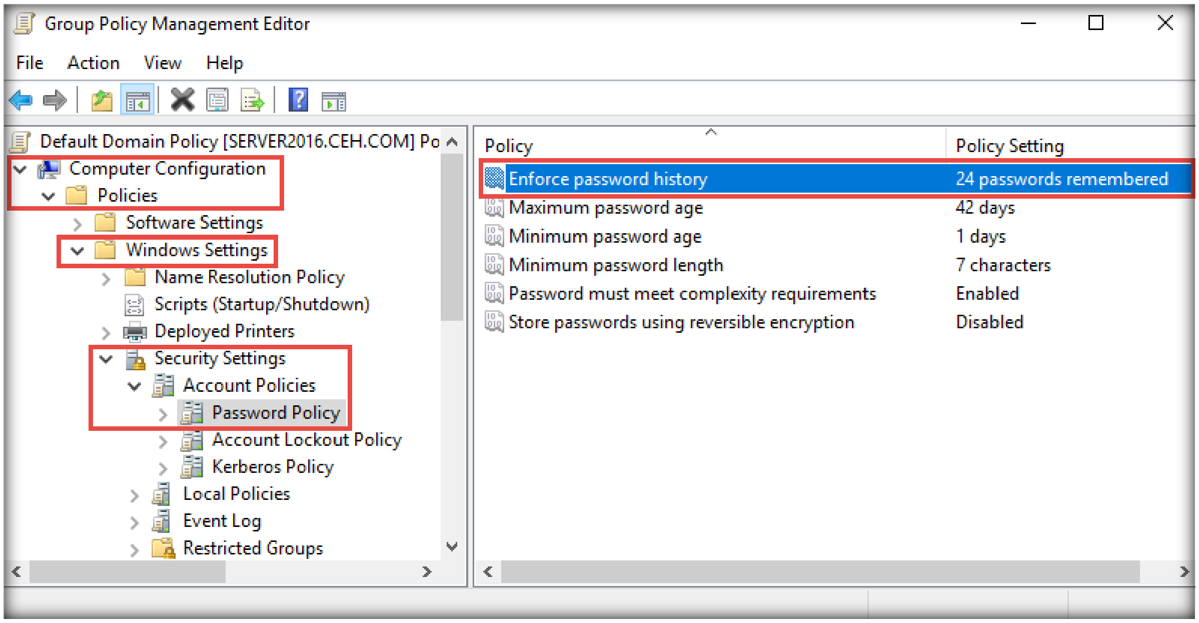
24. The **Default Domain Policy** window appears; select the **Settings** tab.

25. Right-click anywhere in the section, and then select the **Edit...** option from the context menu.


Group Policy Management
File Action View Window Help
Group Policy Management
Forest: CEH.com
Domains
CEH.com
Default Domain Policy
Domain Controllers
Group Policy Objects
WMI Filters
Starter GPOs
Sites
Group Policy Modeling
Group Policy Results
Default Domain Policy
Scope Details Settings Delegation
Default Domain Policy
Data collected on: 9/13/2019 12:22:11 PM
show all
General
hide
Details
show
Links
show
Security Filtering
show
Delegation
show
Computer Configuration (Enabled)
hide
Policies
hide
Windows Settings
hide
Security Settings
show
User Configuration (Enabled)
hide
Edit...
Print
Save Report...
Copy Selection
Select All
Refresh

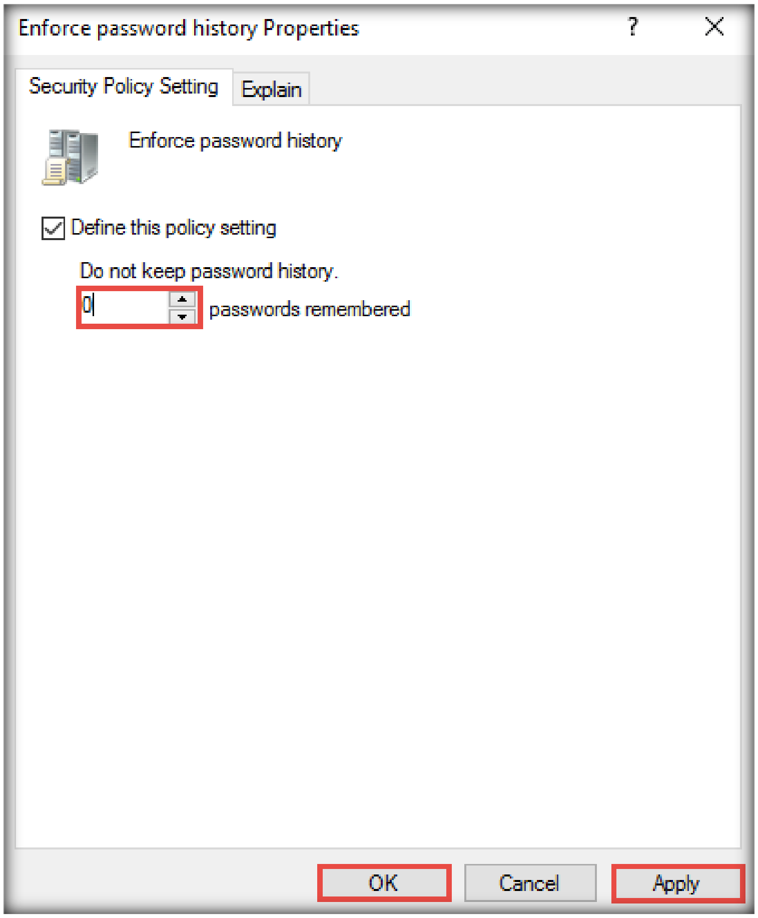
26. The **Group Policy Management Editor** window appears; expand **Computer Configuration → Policies → Windows Settings → Security Settings → Account Policies** and select **Password Policy**.

27. The password policies appear in the right pane, and then double-click **Enforce password history**.


Group Policy Management Editor
File Action View Help
Default Domain Policy [SERVER2016.CEH.COM] Po
Computer Configuration
Policies
Software Settings
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Deployed Printers
Security Settings
Account Policies
Password Policy
Account Lockout Policy
Kerberos Policy
Local Policies
Event Log
Restricted Groups

| Policy | Policy Setting |
|---|---|
| Enforce password history | 24 passwords remembered |
| Maximum password age | 42 days |
| Minimum password age | 1 days |
| Minimum password length | 7 characters |
| Password must meet complexity requirements | Enabled |
| Store passwords using reversible encryption | Disabled |

28. The **Enforce password history Properties** window appears. Type **0** in the **passwords remembered** field; click **Apply,** and then click **OK**.


Enforce password history Properties
?
Security Policy Setting
Explain
OK
Cancel
Apply

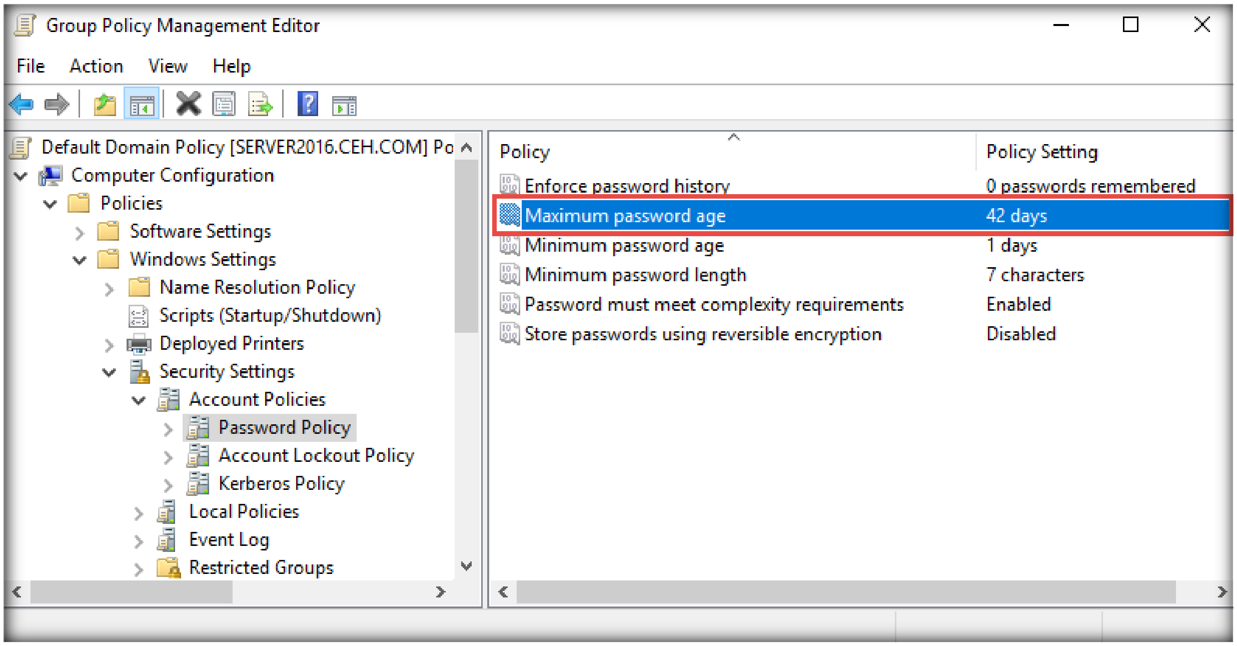
Enforce password history

☑ Define this policy setting

Do not keep password history.

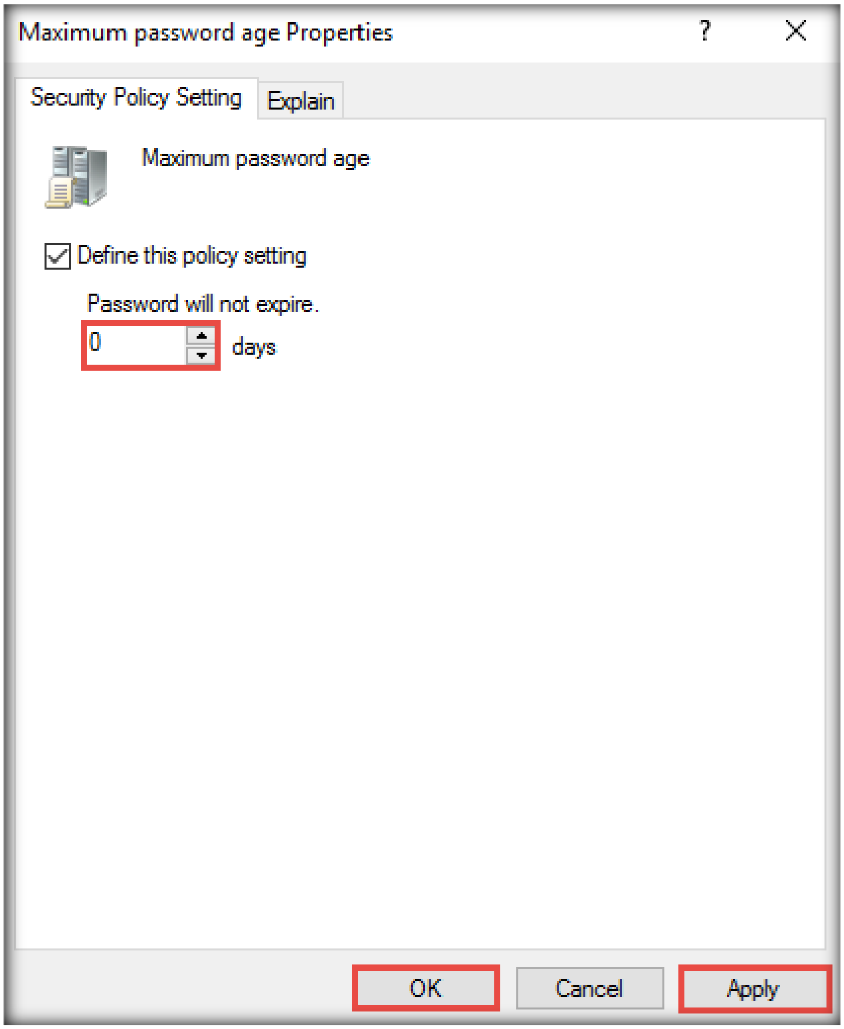
0 passwords remembered

29. Double-click the **Maximum password age** option in the right-hand pane.


Group Policy Management Editor
File
Action
View
Help
Default Domain Policy [SERVER2016.CEH.COM] Po
Computer Configuration
Policies
Software Settings
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Deployed Printers
Security Settings
Account Policies
Password Policy
Account Lockout Policy
Kerberos Policy
Local Policies
Event Log
Restricted Groups

| Policy | Policy Setting |
|---|---|
| Enforce password history | 0 passwords remembered |
| Maximum password age | 42 days |
| Minimum password age | 1 days |
| Minimum password length | 7 characters |
| Password must meet complexity requirements | Enabled |
| Store passwords using reversible encryption | Disabled |

30. The **Maximum password age Properties** window appears. Type **0** in the **days** field; click **Apply**, and then click **OK**.



Maximum password age Properties
?
X
Security Policy Setting
Explain
OK
Cancel
Apply

Maximum password age

☑ Define this policy setting

Password will not expire.

0 days

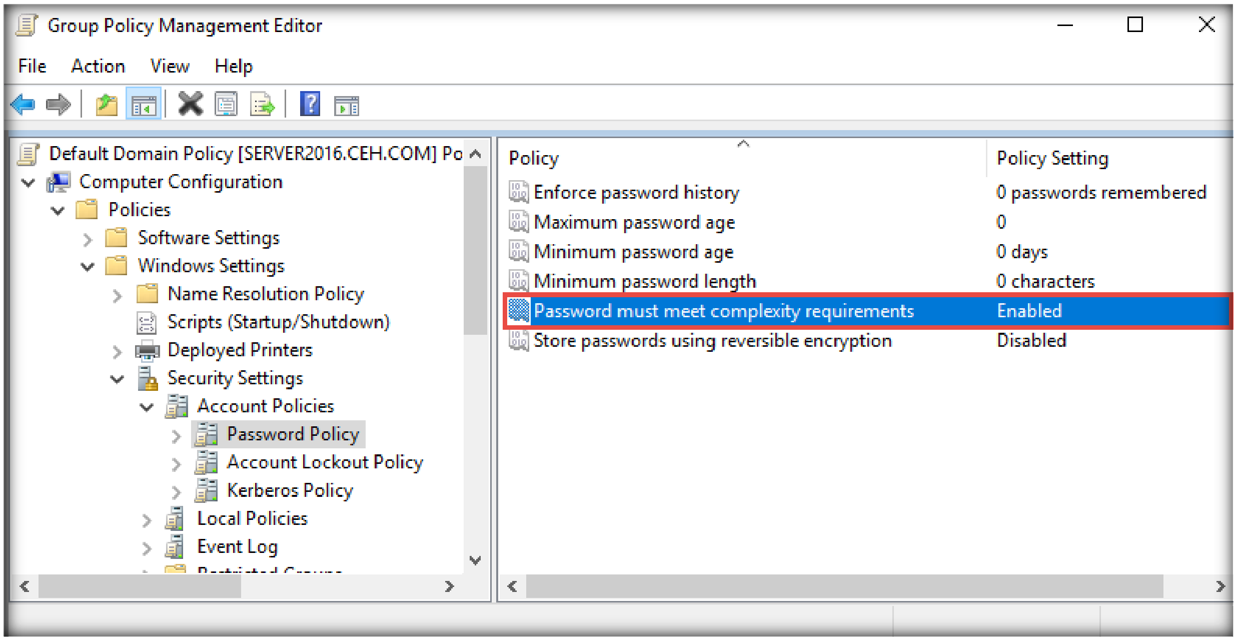
31. Double-click the **Minimum password age** option in the right-hand pane.

32. The **Minimum password age Properties** window appears. Type **0** in the **days** field; click **Apply**, and then click **OK**.

33. Double-click the **Minimum password length** option in the right-hand pane.

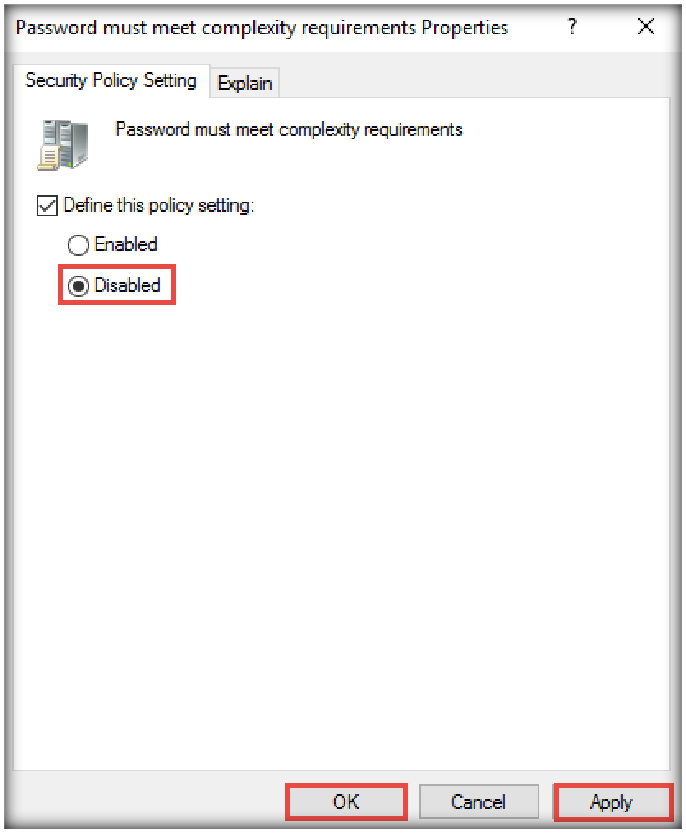
34. The **Minimum password length Properties** window appears. Type **0** in the **characters** field; click **Apply**, and then click **OK**.

35. Double-click the **Password must meet complexity requirements** option in the right-hand pane.


Group Policy Management Editor
File
Action
View
Help
Default Domain Policy [SERVER2016.CEH.COM] Po
Computer Configuration
Policies
Software Settings
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Deployed Printers
Security Settings
Account Policies
Password Policy
Account Lockout Policy
Kerberos Policy
Local Policies
Event Log

| Policy | Policy Setting |
|---|---|
| Enforce password history | 0 passwords remembered |
| Maximum password age | 0 |
| Minimum password age | 0 days |
| Minimum password length | 0 characters |
| Password must meet complexity requirements | Enabled |
| Store passwords using reversible encryption | Disabled |

36. The **Password must meet complexity requirements Properties** window appears. Select the **Disabled** radio button, click **Apply**, and then click **OK.**


Password must meet complexity requirements Properties
?
Security Policy Setting
Explain
OK
Cancel
Apply

Password must meet complexity requirements

☑ Define this policy setting:

○ Enabled

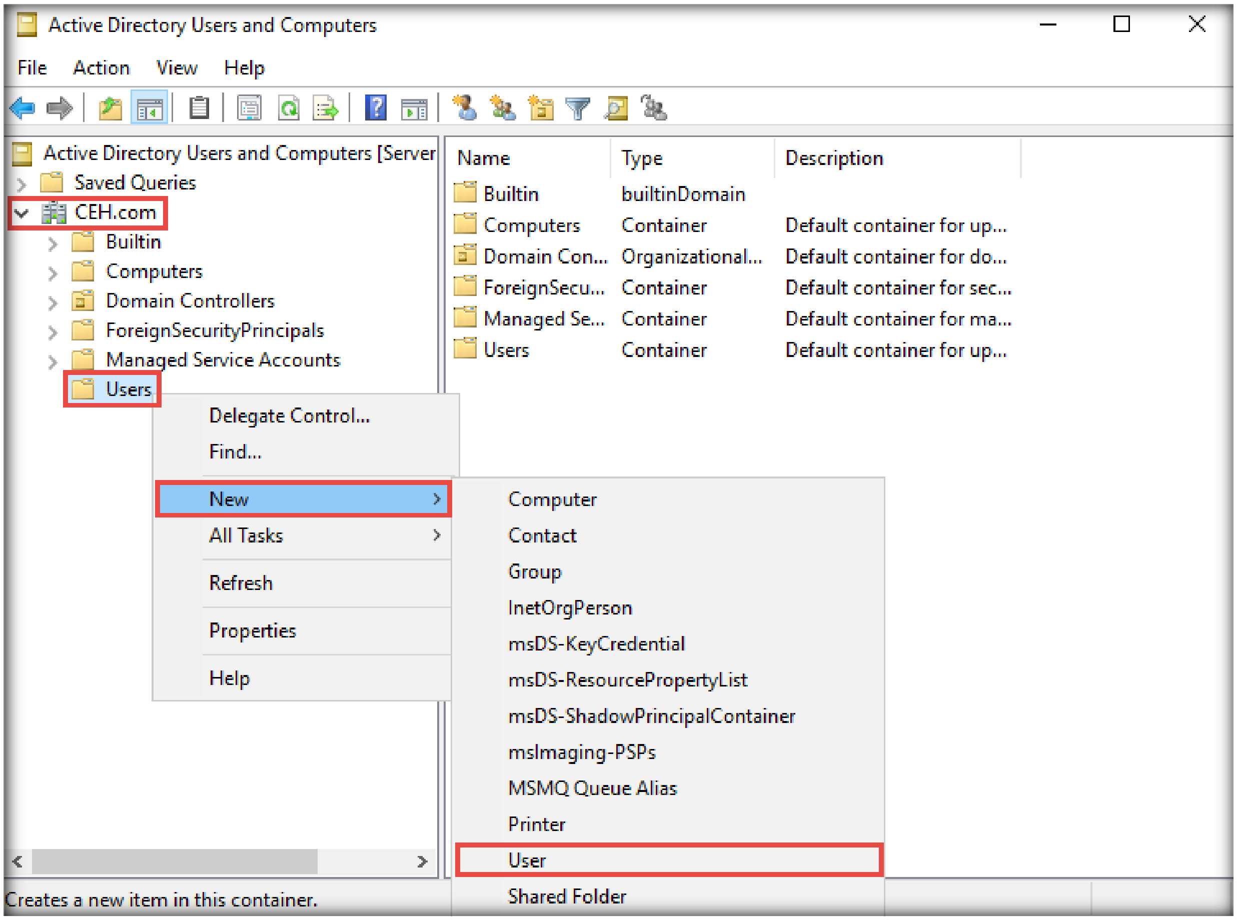
● Disabled

37. Once done, close all windows.

## Create User Accounts and Configure Them

38. Click the **Windows** icon in the lower-left corner of the screen to make the **Start** menu appear, and then click **Windows Administrative Tools** → **Active Directory Users and Computers**.

39. In the **Active Directory Users and Computers** window, expand the **CEH.com** node, right-click **Users**, and click **New** and **User** from the context menu, as shown in the screenshot.

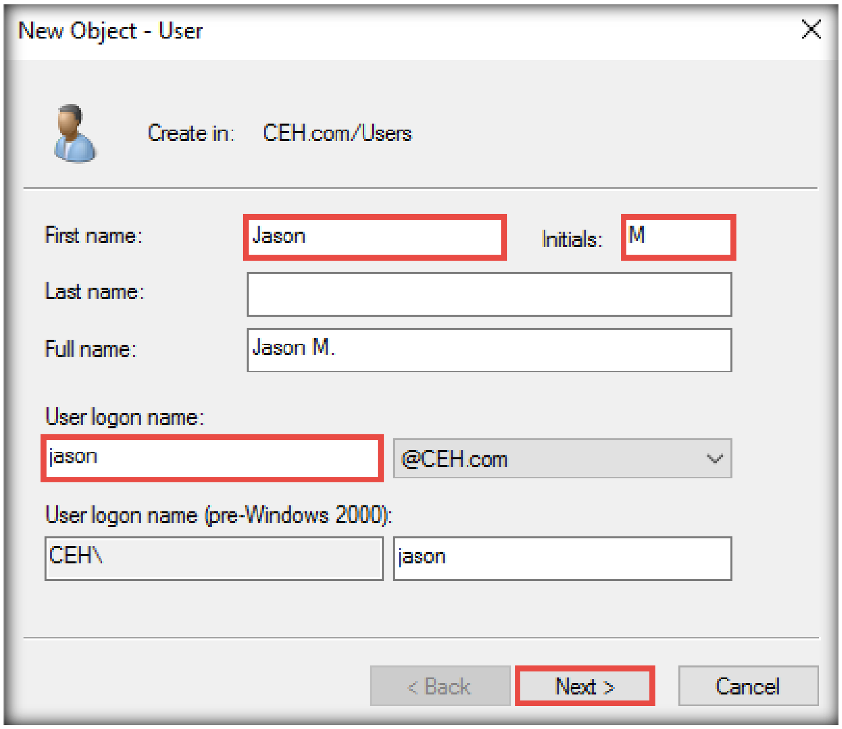

Active Directory Users and Computers
File
Action
View
Help
Active Directory Users and Computers [Server
Saved Queries
CEH.com
Builtin
Computers
Domain Controllers
ForeignSecurityPrincipals
Managed Service Accounts
Users
Delegate Control...
Find...
New
All Tasks
Refresh
Properties
Help
Computer
Contact
Group
InetOrgPerson
msDS-KeyCredential
msDS-ResourcePropertyList
msDS-ShadowPrincipalContainer
msImaging-PSPs
MSMQ Queue Alias
Printer
User
Shared Folder

| Name | Type | Description |
|---|---|---|
| Builtin | builtinDomain | |
| Computers | Container | Default container for up... |
| Domain Con... | Organizational... | Default container for do... |
| ForeignSecu... | Container | Default container for sec... |
| Managed Se... | Container | Default container for ma... |
| Users | Container | Default container for up... |

Creates a new item in this container.

40. The **New Object - User** dialog box appears; fill in the required fields.

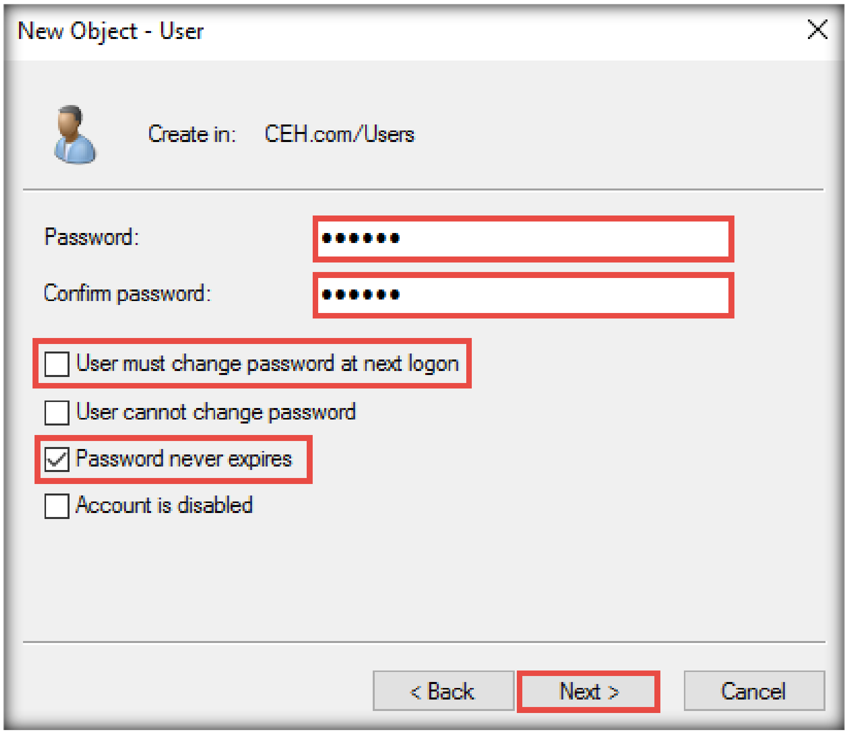
41. Type **Jason** in the **First name:** field, the initial of your choice, and **Jason** in the **User logon name:** field. Then, click **Next.**



Create in: CEH.com/Users

First name: Jason
Initials: M
Last name:
Full name: Jason M.
User logon name: jason @CEH.com
User logon name (pre-Windows 2000): CEH\ jason

42. Type **qwerty** in the **Password** and **Confirm password** fields, uncheck **User must change password at next logon**, and check the **Password never expires** option. Then, click **Next**.

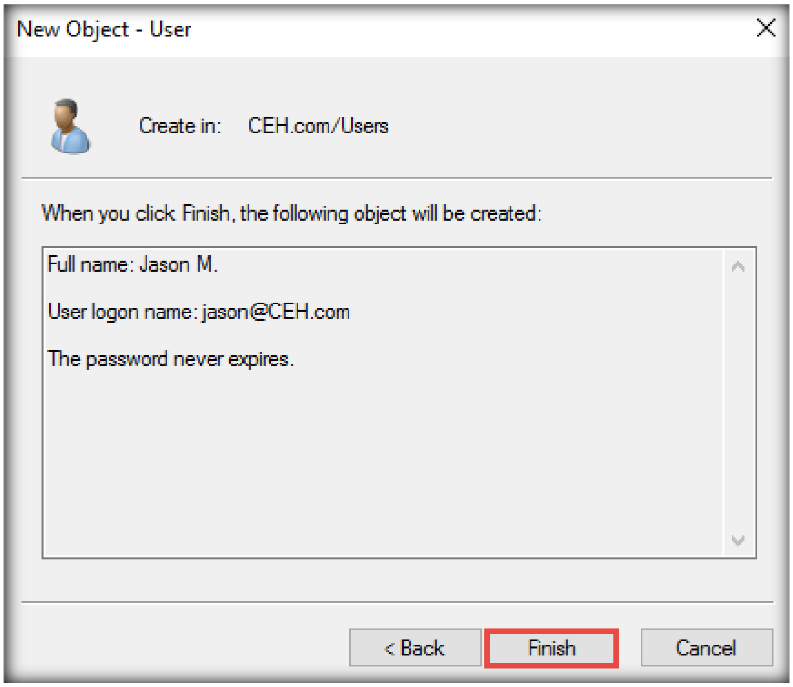


Create in: CEH.com/Users

Password: ••••••
Confirm password: ••••••

☐ User must change password at next logon
☐ User cannot change password
☑ Password never expires
☐ Account is disabled

43. Once the **User** is successfully created, click **Finish**.



New Object - User

Create in: CEH.com/Users

When you click Finish, the following object will be created:

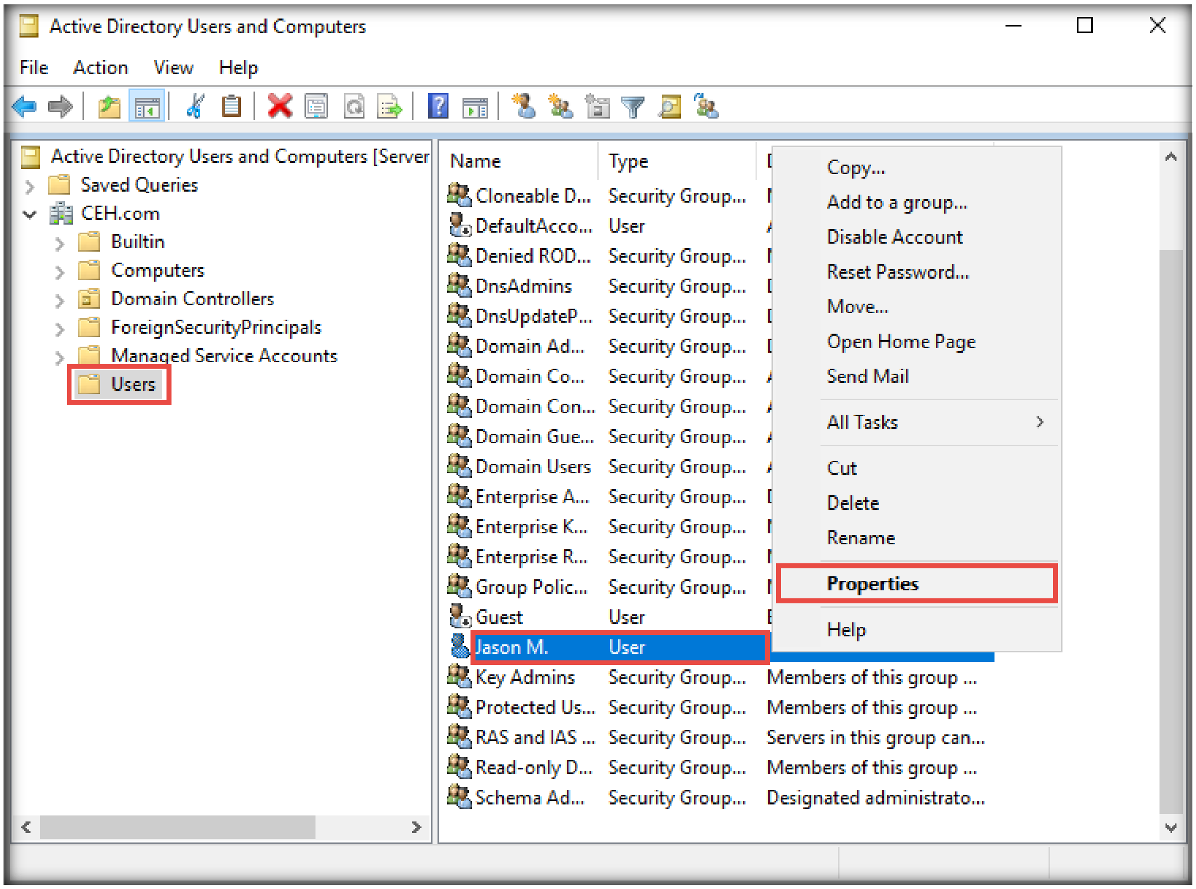
Full name: Jason M.

User logon name: jason@CEH.com

The password never expires.

< Back
Finish
Cancel

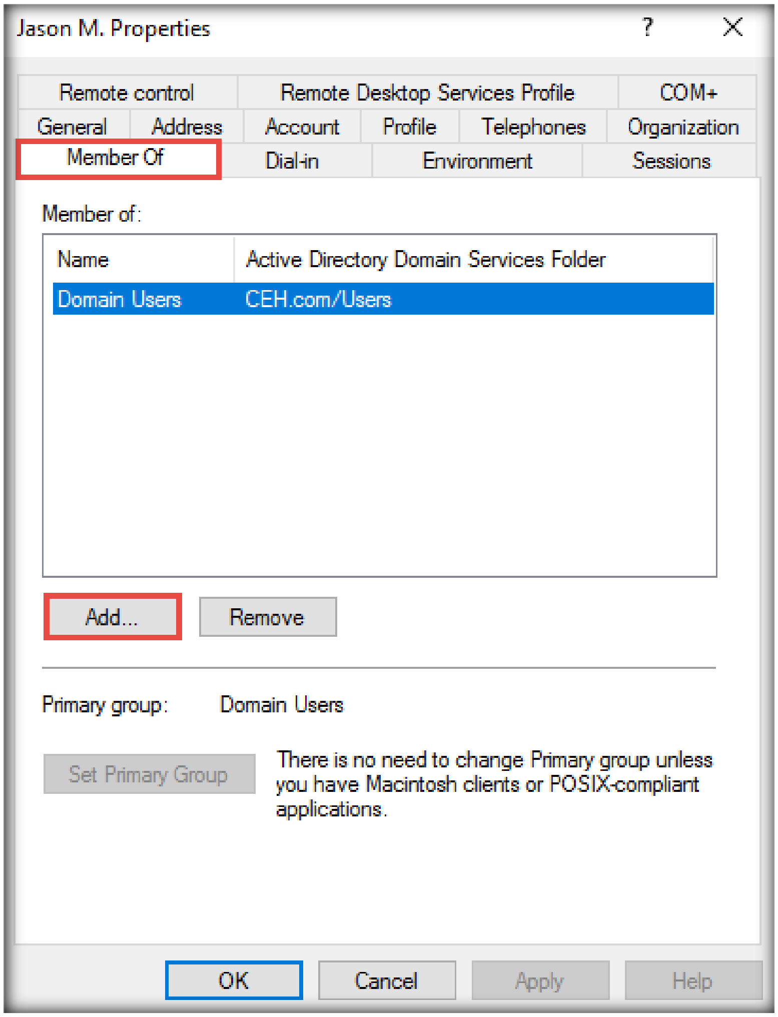
44. Now, click **Users** from the left-hand pane, right-click on the created user (here, **Jason M.**), and click **Properties** from the context menu.



Active Directory Users and Computers
File
Action
View
Help
Active Directory Users and Computers [Server
Saved Queries
CEH.com
Builtin
Computers
Domain Controllers
ForeignSecurityPrincipals
Managed Service Accounts
Users
Copy...
Add to a group...
Disable Account
Reset Password...
Move...
Open Home Page
Send Mail
All Tasks
Cut
Delete
Rename
Properties
Help

| Name | Type | |
|---|---|---|
| Cloneable D... | Security Group... | |
| DefaultAcco... | User | |
| Denied ROD... | Security Group... | |
| DnsAdmins | Security Group... | |
| DnsUpdateP... | Security Group... | |
| Domain Ad... | Security Group... | |
| Domain Co... | Security Group... | |
| Domain Con... | Security Group... | |
| Domain Gue... | Security Group... | |
| Domain Users | Security Group... | |
| Enterprise A... | Security Group... | |
| Enterprise K... | Security Group... | |
| Enterprise R... | Security Group... | |
| Group Polic... | Security Group... | |
| Guest | User | |
| Jason M. | User | |
| Key Admins | Security Group... | Members of this group ... |
| Protected Us... | Security Group... | Members of this group ... |
| RAS and IAS ... | Security Group... | Servers in this group can... |
| Read-only D... | Security Group... | Members of this group ... |
| Schema Ad... | Security Group... | Designated administrato... |

45. In the user **Properties** window, click the **Member Of** tab and click the **Add...** button.


Jason M. Properties
?
Remote control
Remote Desktop Services Profile
COM+
General
Address
Account
Profile
Telephones
Organization
Member Of
Dial-in
Environment
Sessions
Add...
Remove
Set Primary Group
OK
Cancel
Apply
Help

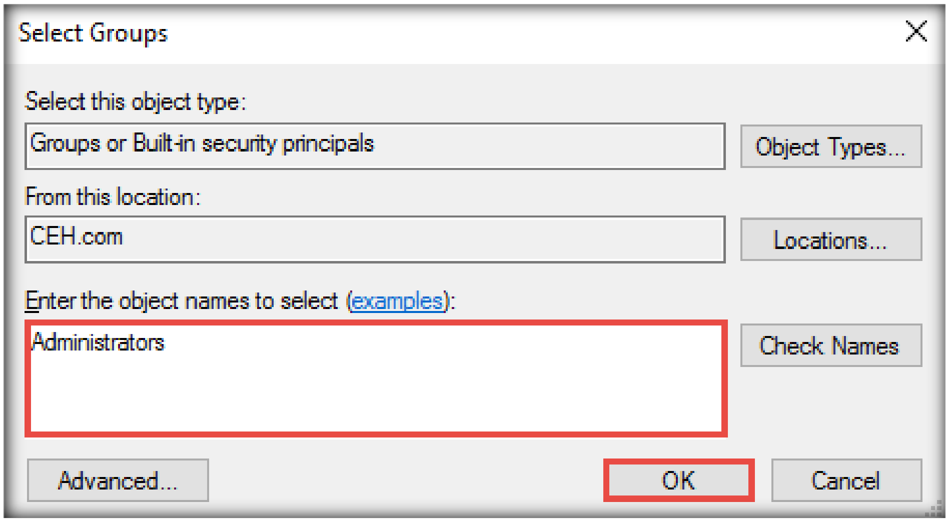
Member of:

| Name | Active Directory Domain Services Folder |
|---|---|
| Domain Users | CEH.com/Users |

Primary group: Domain Users

There is no need to change Primary group unless you have Macintosh clients or POSIX-compliant applications.

46. In the **Select Groups** window, type **Administrators** and click **OK**. This will make the user a member of the Administrators group.

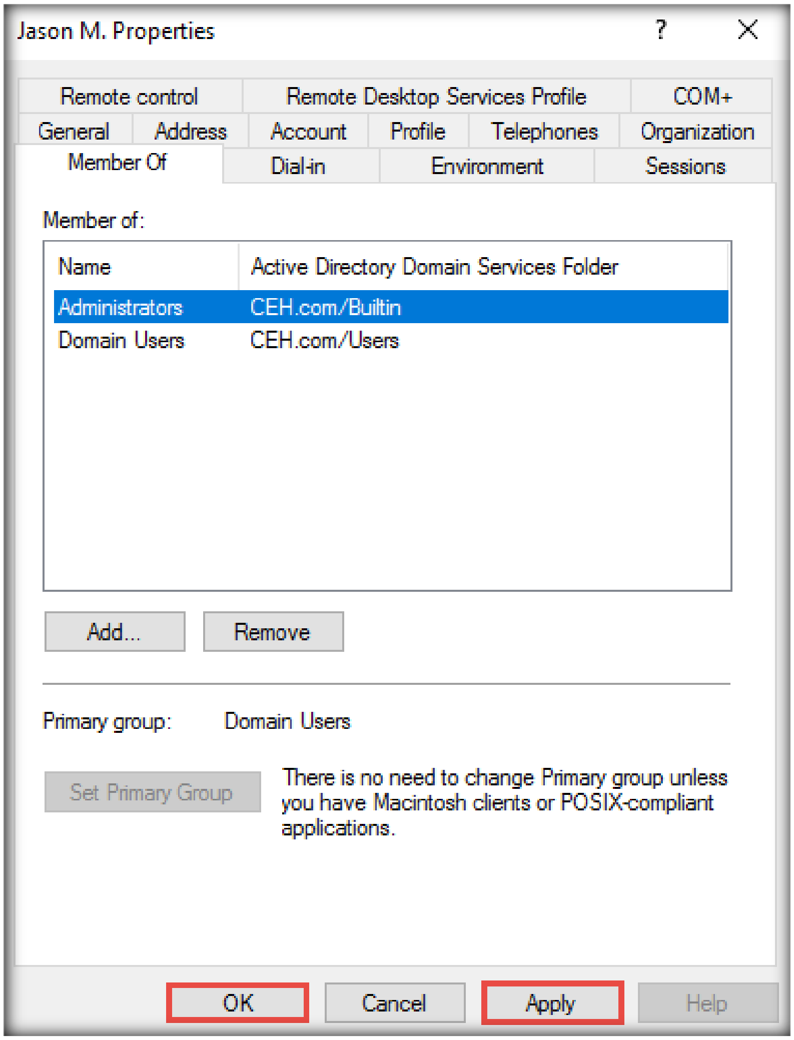

Select Groups
Object Types...
Locations...
Check Names
Advanced...
OK
Cancel

Select this object type:
Groups or Built-in security principals

From this location:
CEH.com

Enter the object names to select (examples):
Administrators

47. Click **Apply** and **OK** in the user **Properties** window.


Jason M. Properties
?
Remote control
Remote Desktop Services Profile
COM+
General
Address
Account
Profile
Telephones
Organization
Member Of
Dial-in
Environment
Sessions
Add...
Remove
Set Primary Group
OK
Cancel
Apply
Help

Member of:

| Name | Active Directory Domain Services Folder |
|---|---|
| Administrators | CEH.com/Builtin |
| Domain Users | CEH.com/Users |

Primary group: Domain Users

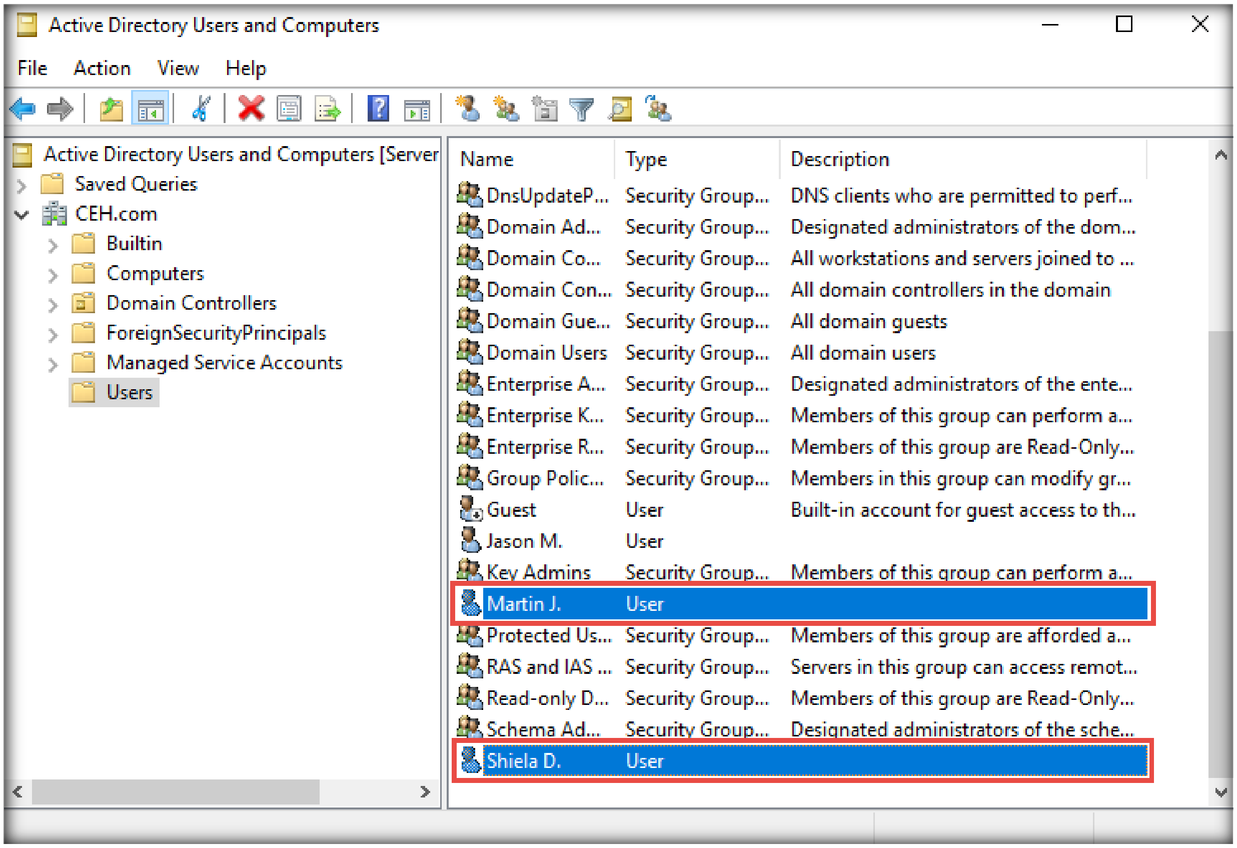
There is no need to change Primary group unless you have Macintosh clients or POSIX-compliant applications.

48. Similarly, create the following users in the Active Directory by following steps **40–44**

    I. Username: **Martin**; Password: **apple**

    II. Username: **Shiela**; Password: **test**

**Note**: You may also assign admin privileges to any of these accounts by continuing through steps **45–48**.


Active Directory Users and Computers
File
Action
View
Help
Active Directory Users and Computers [Server
Saved Queries
CEH.com
Builtin
Computers
Domain Controllers
ForeignSecurityPrincipals
Managed Service Accounts
Users

| Name | Type | Description |
|---|---|---|
| DnsUpdateP... | Security Group... | DNS clients who are permitted to perf... |
| Domain Ad... | Security Group... | Designated administrators of the dom... |
| Domain Co... | Security Group... | All workstations and servers joined to ... |
| Domain Con... | Security Group... | All domain controllers in the domain |
| Domain Gue... | Security Group... | All domain guests |
| Domain Users | Security Group... | All domain users |
| Enterprise A... | Security Group... | Designated administrators of the ente... |
| Enterprise K... | Security Group... | Members of this group can perform a... |
| Enterprise R... | Security Group... | Members of this group are Read-Only... |
| Group Polic... | Security Group... | Members in this group can modify gr... |
| Guest | User | Built-in account for guest access to th... |
| Jason M. | User | |
| Key Admins | Security Group... | Members of this group can perform a... |
| Martin J. | User | |
| Protected Us... | Security Group... | Members of this group are afforded a... |
| RAS and IAS ... | Security Group... | Servers in this group can access remot... |
| Read-only D... | Security Group... | Members of this group are Read-Only... |
| Schema Ad... | Security Group... | Designated administrators of the sche... |
| Shiela D. | User | |

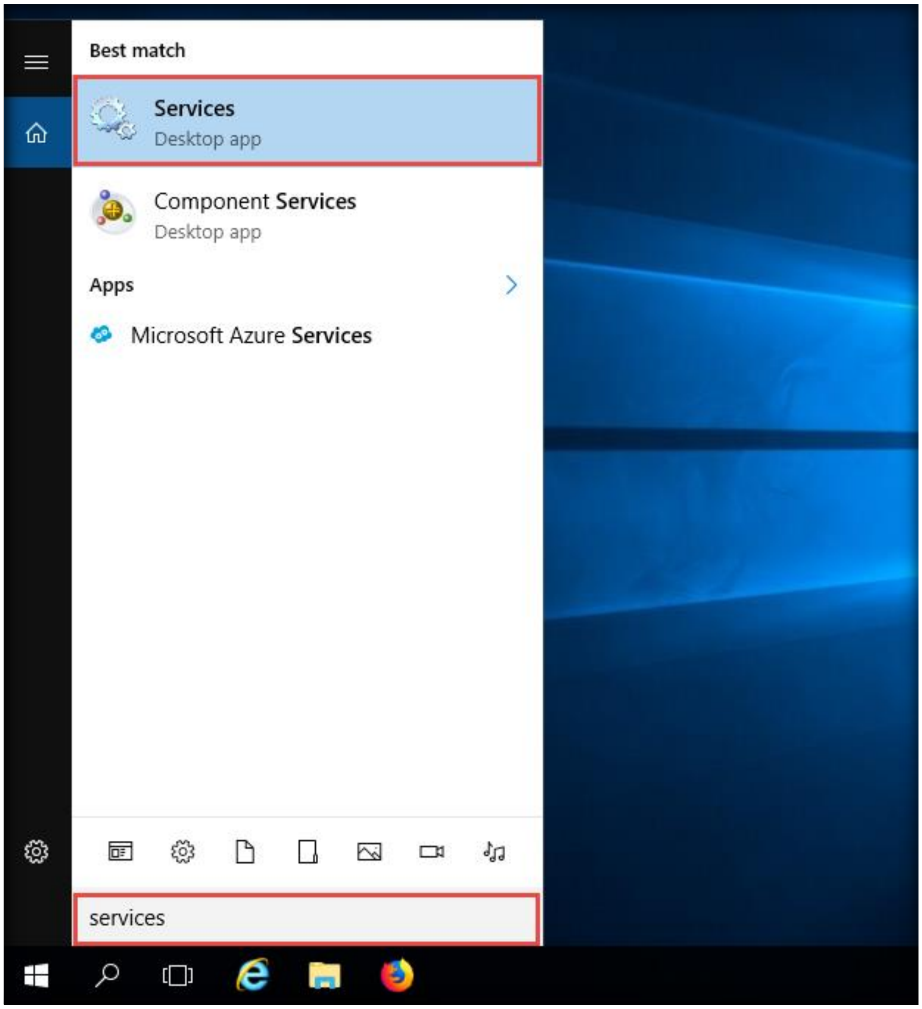
[Back to Configuration Task Outline]

# CT#30: Configure the SNMP Service in the Windows Server 2016 and Windows Server 2019 Virtual Machines

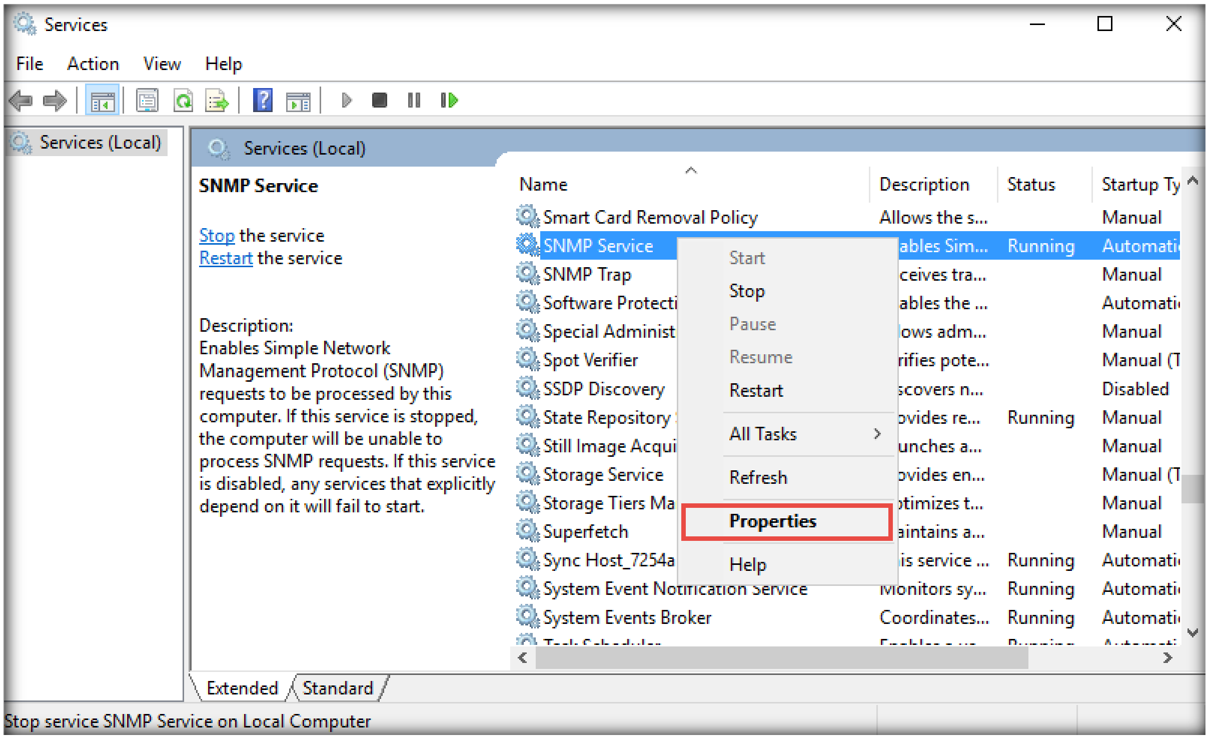
### Configuring the SNMP Service on Windows Server 2016:

As you have already installed the SNMP service on the Windows Server 2016 virtual machine, you only need to configure it on this machine. For this, launch **Services**.

1. On the **Windows Server 2016** virtual machine, click the **Search** icon in the taskbar, type **services** in the search field, and then click **Services Desktop app**.


Best match
Services
Desktop app
Component Services
Desktop app
Apps
Microsoft Azure Services
services

2. The **Services** window appears; right-click **SNMP Service** and click **Properties** from the context menu.

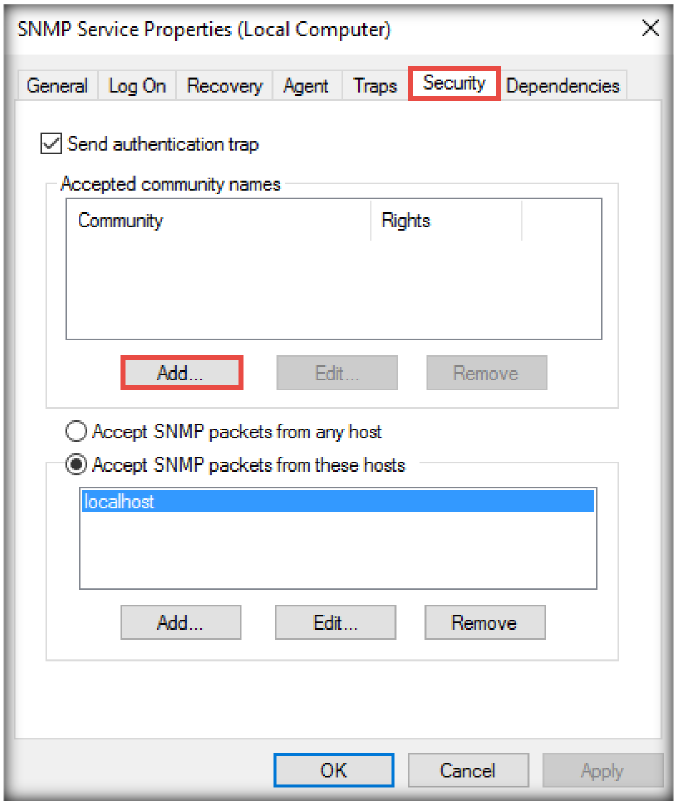

Services
File Action View Help
Services (Local)
Services (Local)
SNMP Service
Stop the service
Restart the service
Name
Description
Status
Startup Ty
Start
Stop
Pause
Resume
Restart
All Tasks
Refresh
Properties
Help
Extended
Standard

Description:
Enables Simple Network Management Protocol (SNMP) requests to be processed by this computer. If this service is stopped, the computer will be unable to process SNMP requests. If this service is disabled, any services that explicitly depend on it will fail to start.

| Name | Description | Status | Startup Ty |
|---|---|---|---|
| Smart Card Removal Policy | Allows the s... | | Manual |
| SNMP Service | ables Sim... | Running | Automati |
| SNMP Trap | ceives tra... | | Manual |
| Software Protecti | ables the ... | | Automati |
| Special Administ | ows adm... | | Manual |
| Spot Verifier | rifies pote... | | Manual (T |
| SSDP Discovery | scovers n... | | Disabled |
| State Repository | ovides re... | Running | Manual |
| Still Image Acqui | unches a... | | Manual |
| Storage Service | ovides en... | | Manual (T |
| Storage Tiers Ma | ptimizes t... | | Manual |
| Superfetch | aintains a... | | Manual |
| Sync Host_7254a | is service ... | Running | Automati |
| System Event Notification Service | Monitors sy... | Running | Automati |
| System Events Broker | Coordinates... | Running | Automati |

Stop service SNMP Service on Local Computer

3. Click the **Security** tab in the **SNMP Service Properties (Local Computer)** window and click the **Add...** button under the **Accepted community names** section.


SNMP Service Properties (Local Computer)
General
Log On
Recovery
Agent
Traps
Security
Dependencies
Accepted community names
Community
Rights
Add...
Edit...
Remove
Add...
Edit...
Remove
OK
Cancel
Apply

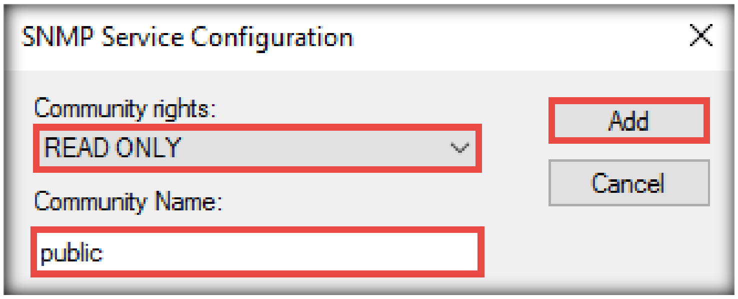
☑ Send authentication trap

○ Accept SNMP packets from any host

● Accept SNMP packets from these hosts

localhost

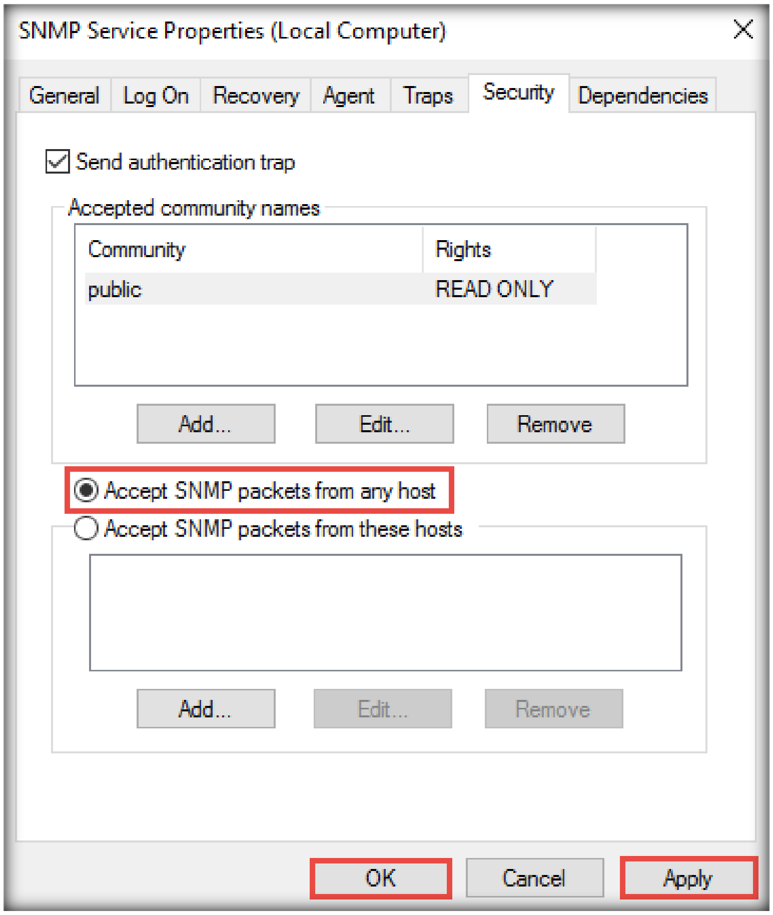
4. **The SNMP Service Configuration** window appears. **Community rights** should be **READ ONLY**. In the **Community Name** section, type **public** (lowercase only) and click the **Add** button.


SNMP Service Configuration

Community rights: READ ONLY

Community Name: public

5. After adding the **Accepted community names** details, select the **Accept SNMP packets from any host** radio button; click **Apply**, and then click **OK**.


SNMP Service Properties (Local Computer)

General
Log On
Recovery
Agent
Traps
Security
Dependencies

☑ Send authentication trap

Accepted community names

| Community | Rights |
|---|---|
| public | READ ONLY |

Add...
Edit...
Remove

● Accept SNMP packets from any host

○ Accept SNMP packets from these hosts

Add...
Edit...
Remove
OK
Cancel
Apply

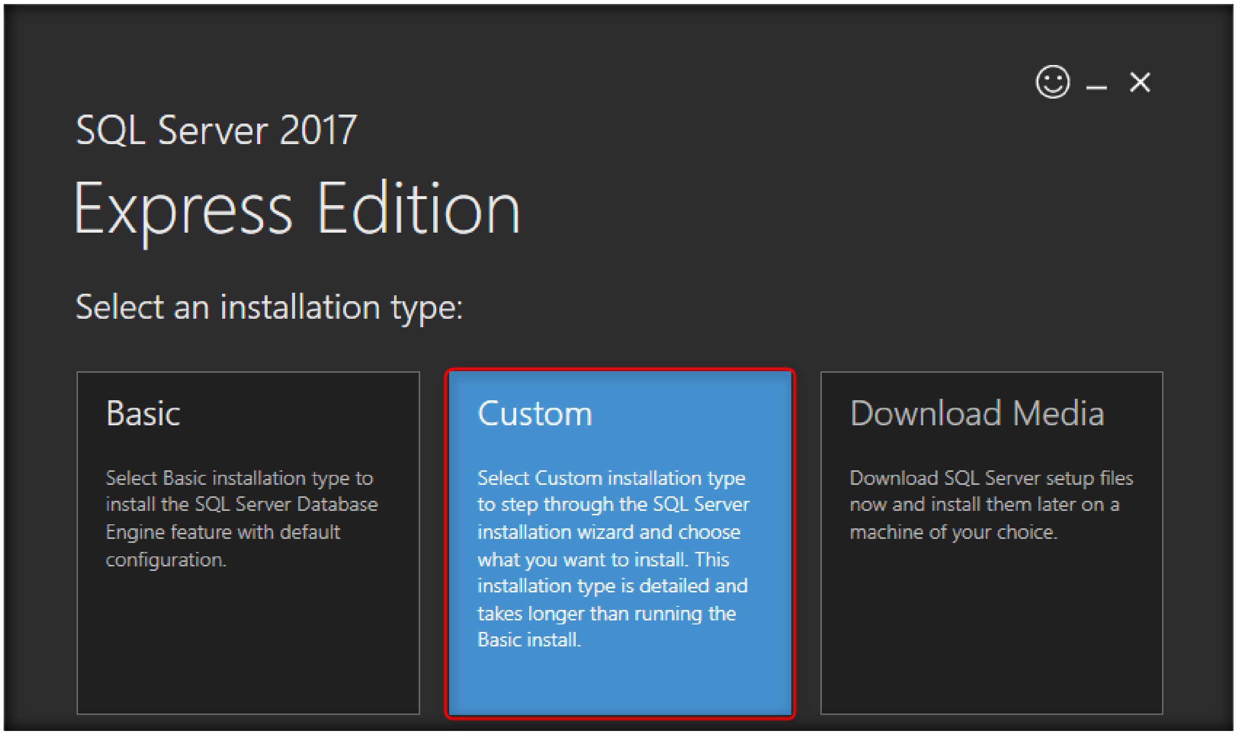
6. Close all windows.
7. Similarly, configure the SNMP Service on the **Windows Server 2019** virtual machine.

[Back to Configuration Task Outline]

# CT#31: Install MS SQL Server 2017 Express Edition on the Windows Server 2019 Virtual Machine

**Note**: Ensure that the **Windows 10** virtual machine is running.

1. On the **Windows Server 2019** virtual machine, navigate to **Z:\CEHv11 Lab Prerequisites\MSSQL Server Express 2017** and double-click **SQLServer2017-SSEI-Expr.exe**.
2. If a **User Account Control** pop-up appears, click **Yes**.
3. The **SQL Server 2017** window appears; click **Custom**.



SQL Server 2017

Express Edition

Select an installation type:

Basic

Select Basic installation type to install the SQL Server Database Engine feature with default configuration.

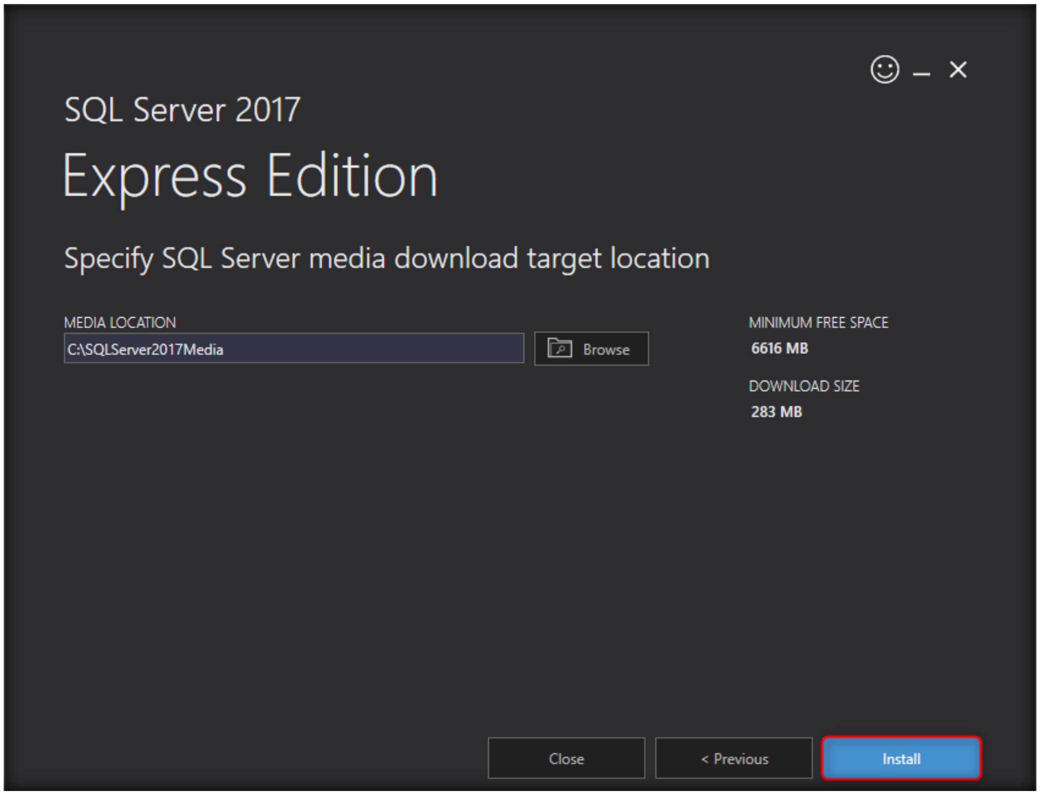
Custom

Select Custom installation type to step through the SQL Server installation wizard and choose what you want to install. This installation type is detailed and takes longer than running the Basic install.

Download Media

Download SQL Server setup files now and install them later on a machine of your choice.

4. The **Specify SQL Server media download target location** section appears; click **Install**.



SQL Server 2017

Express Edition

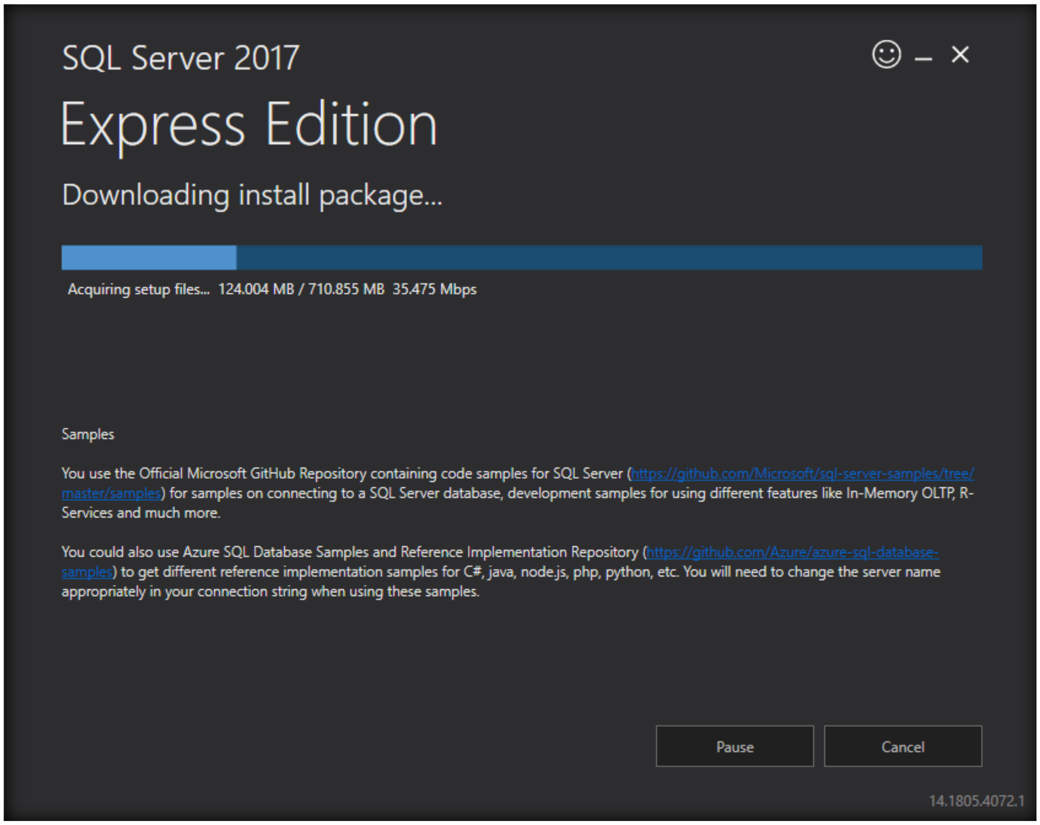
Specify SQL Server media download target location

MEDIA LOCATION: C:\SQLServer2017Media

MINIMUM FREE SPACE: 6616 MB

DOWNLOAD SIZE: 283 MB

5. The program starts downloading the setup files. Wait for the Installation Center to launch.



SQL Server 2017

Express Edition

Downloading install package...

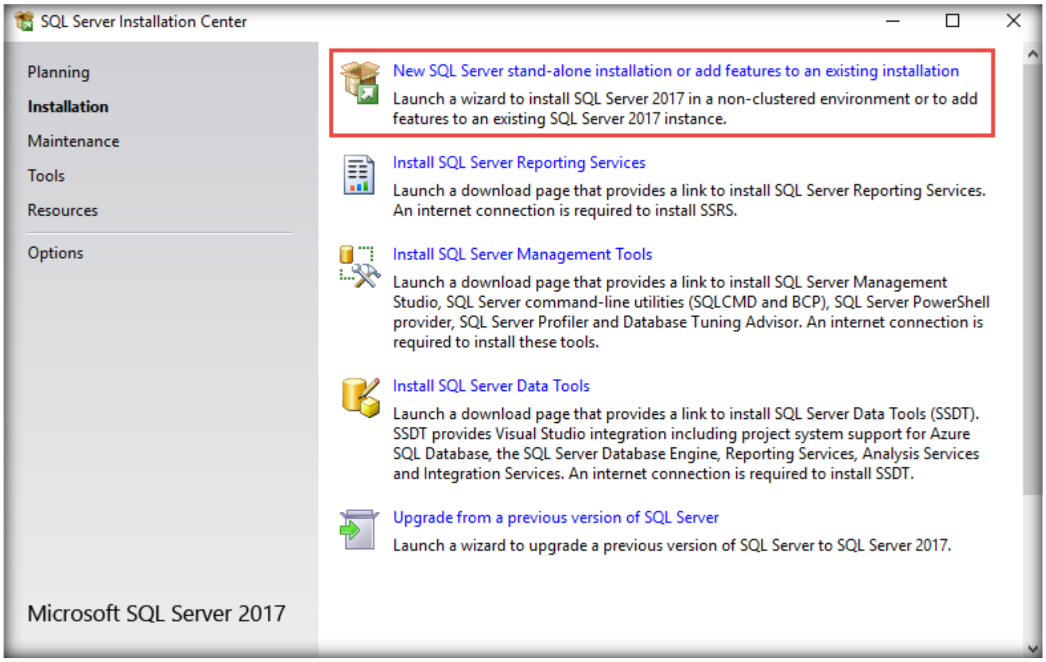
Acquiring setup files... 124.004 MB / 710.855 MB 35.475 Mbps

Samples

You use the Official Microsoft GitHub Repository containing code samples for SQL Server (https://github.com/Microsoft/sql-server-samples/tree/master/samples) for samples on connecting to a SQL Server database, development samples for using different features like In-Memory OLTP, R-Services and much more.

You could also use Azure SQL Database Samples and Reference Implementation Repository (https://github.com/Azure/azure-sql-database-samples) to get different reference implementation samples for C#, java, node.js, php, python, etc. You will need to change the server name appropriately in your connection string when using these samples.

6. **The SQL Server Installation Center** window appears with the **Installation** section displayed by default. Click the **New SQL Server stand-alone installation or add features to an existing installation** link and wait for the command to process.



SQL Server Installation Center
Planning
Installation
Maintenance
Tools
Resources
Options
Microsoft SQL Server 2017

New SQL Server stand-alone installation or add features to an existing installation

Launch a wizard to install SQL Server 2017 in a non-clustered environment or to add features to an existing SQL Server 2017 instance.

Install SQL Server Reporting Services

Launch a download page that provides a link to install SQL Server Reporting Services. An internet connection is required to install SSRS.

Install SQL Server Management Tools

Launch a download page that provides a link to install SQL Server Management Studio, SQL Server command-line utilities (SQLCMD and BCP), SQL Server PowerShell provider, SQL Server Profiler and Database Tuning Advisor. An internet connection is required to install these tools.

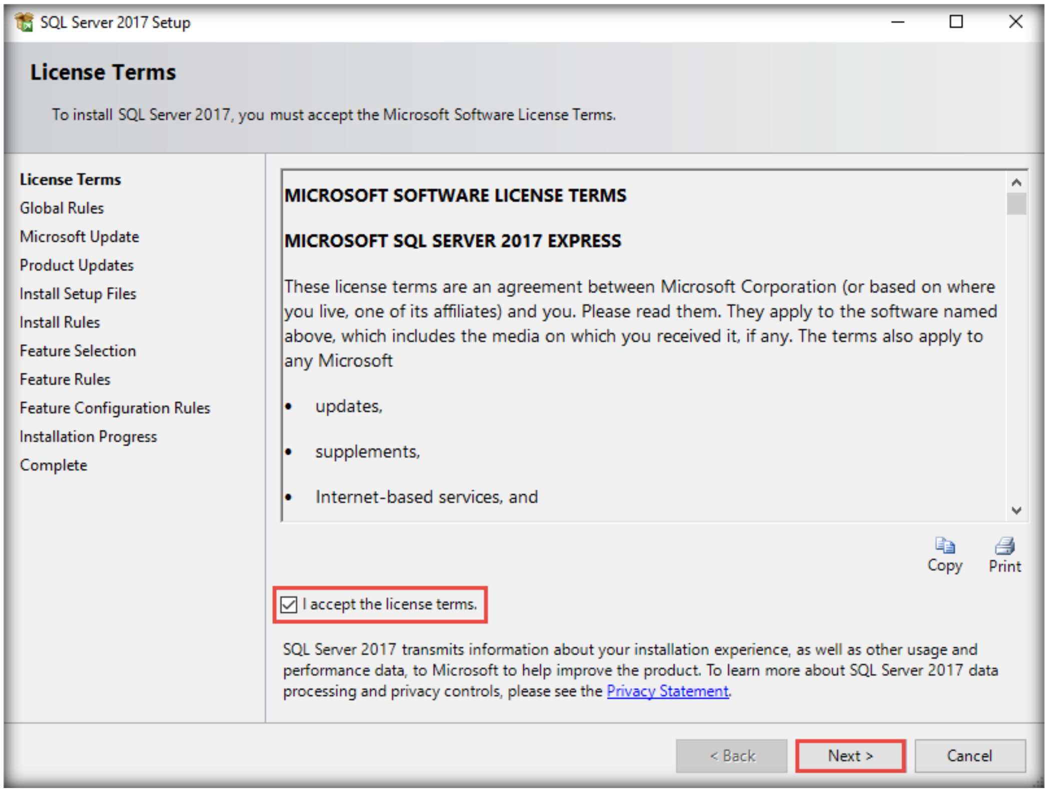
Install SQL Server Data Tools

Launch a download page that provides a link to install SQL Server Data Tools (SSDT). SSDT provides Visual Studio integration including project system support for Azure SQL Database, the SQL Server Database Engine, Reporting Services, Analysis Services and Integration Services. An internet connection is required to install SSDT.

Upgrade from a previous version of SQL Server

Launch a wizard to upgrade a previous version of SQL Server to SQL Server 2017.

7. The **SQL Server 2017 Setup** window appears; read the software license terms in the **License Terms** section, check the option **I accept the license terms**, and then click **Next**.



SQL Server 2017 Setup
License Terms
Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Feature Selection
Feature Rules
Feature Configuration Rules
Installation Progress
Complete
Copy
Print
< Back
Next >
Cancel

License Terms

To install SQL Server 2017, you must accept the Microsoft Software License Terms.

MICROSOFT SOFTWARE LICENSE TERMS

MICROSOFT SQL SERVER 2017 EXPRESS

These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft

- updates,
- supplements,
- Internet-based services, and

☑ I accept the license terms.

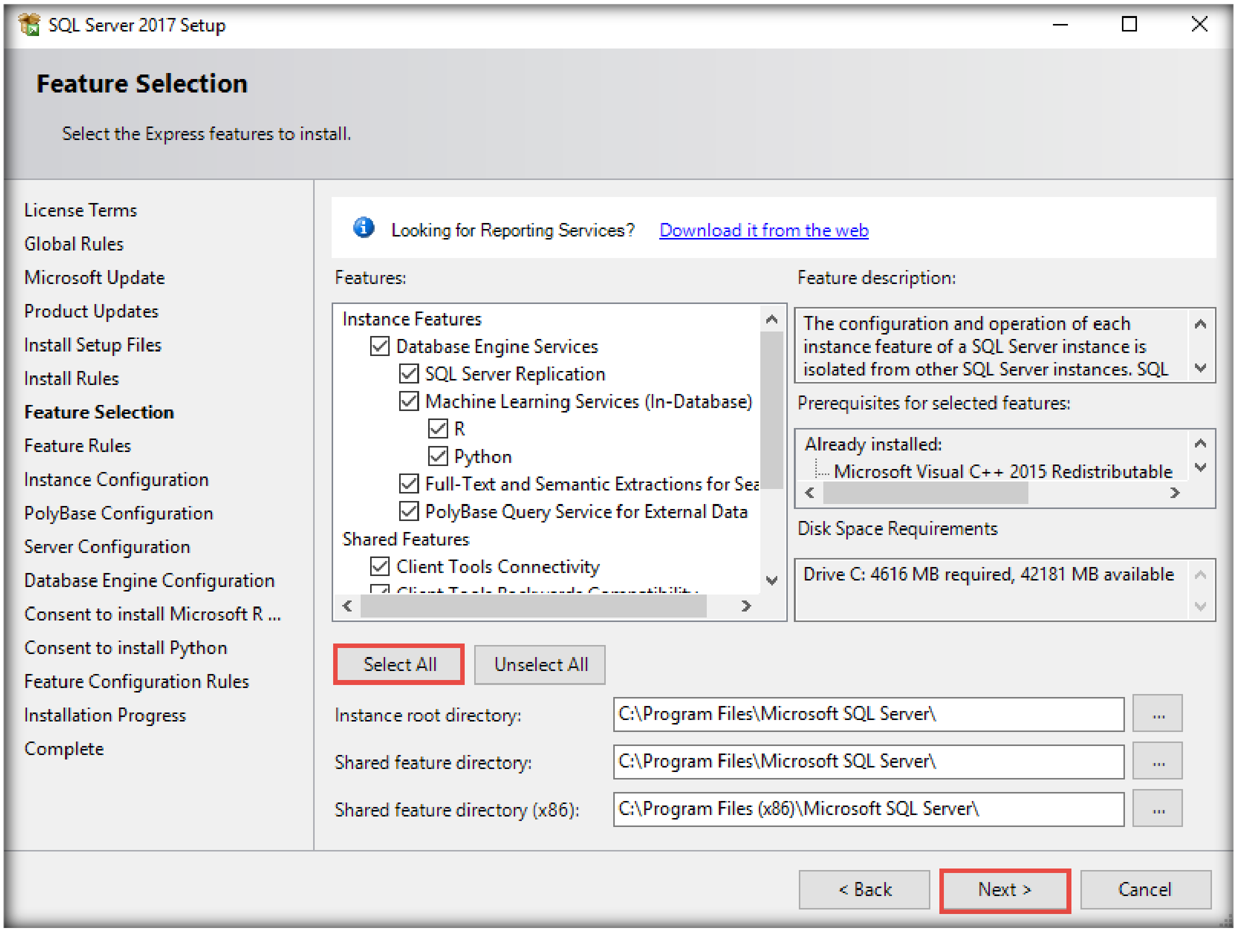
SQL Server 2017 transmits information about your installation experience, as well as other usage and performance data, to Microsoft to help improve the product. To learn more about SQL Server 2017 data processing and privacy controls, please see the Privacy Statement.

8. The **Microsoft Update** section appears; click **Next**.

9. The **Install Rules** verifies the system state of your computer before the setup continues.
10. After verification has finished, click **Next**.
11. In the **Feature Selection** window, select the express features for installation.
12. Click the **Select All** button to select all the features, and then click **Next**.

    Note:

    - A **description** for each feature group appears in the **right pane** after you select the feature.
    - You can select any **combination** of checkboxes.
    - To change the **installation path** for the shared components, either **update** the path in the field for **Shared feature directory** and **Shared feature directory (x86)** or click the **Browse** button to select another installation directory.
    - The default installation path for the shared feature directory is **C:\Program Files\Microsoft SQL Server**.
    - The default installation path for the shared feature directory (x86) is **C:\Program Files (x86)\Microsoft SQL Server**.


SQL Server 2017 Setup
License Terms
Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Feature Selection
Feature Rules
Instance Configuration
PolyBase Configuration
Server Configuration
Database Engine Configuration
Consent to install Microsoft R ...
Consent to install Python
Feature Configuration Rules
Installation Progress
Complete
Select All
Unselect All
< Back
Next >
Cancel

**Feature Selection**

Select the Express features to install.

Looking for Reporting Services? Download it from the web

Features:

Instance Features
- ☑ Database Engine Services
  - ☑ SQL Server Replication
  - ☑ Machine Learning Services (In-Database)
    - ☑ R
    - ☑ Python
  - ☑ Full-Text and Semantic Extractions for Sea
  - ☑ PolyBase Query Service for External Data

Shared Features
- ☑ Client Tools Connectivity

Feature description:

The configuration and operation of each instance feature of a SQL Server instance is isolated from other SQL Server instances. SQL

Prerequisites for selected features:

Already installed:
Microsoft Visual C++ 2015 Redistributable

Disk Space Requirements

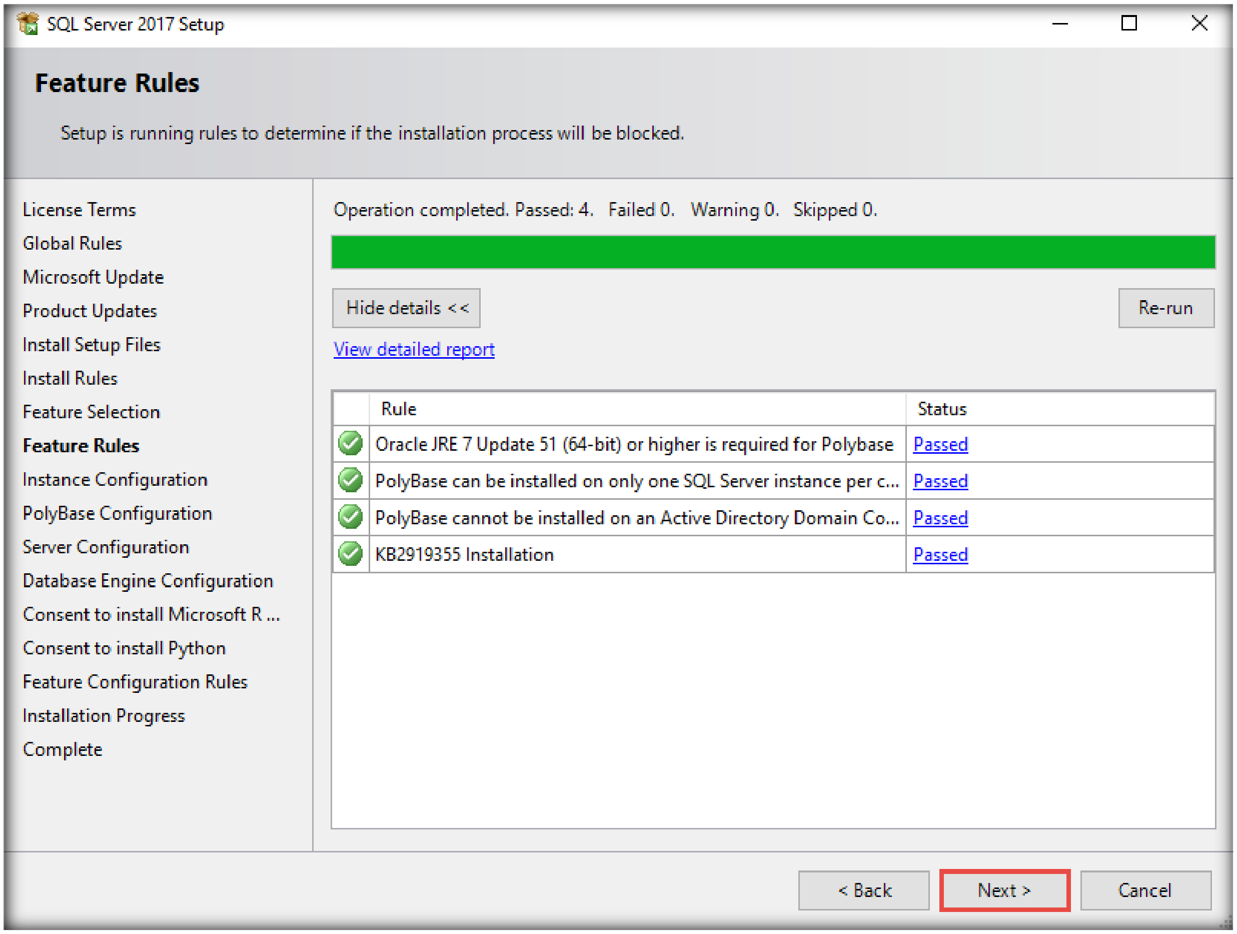
Drive C: 4616 MB required, 42181 MB available

Instance root directory: C:\Program Files\Microsoft SQL Server\

Shared feature directory: C:\Program Files\Microsoft SQL Server\

Shared feature directory (x86): C:\Program Files (x86)\Microsoft SQL Server\

13. The **Feature Rules** section appears and verifies the prerequisites for the installation. Then, click the **Show details >>** button.
14. If all the prerequisites are present, click **Next**.


SQL Server 2017 Setup
License Terms
Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Feature Selection
Feature Rules
Instance Configuration
PolyBase Configuration
Server Configuration
Database Engine Configuration
Consent to install Microsoft R ...
Consent to install Python
Feature Configuration Rules
Installation Progress
Complete
Hide details <<
Re-run
View detailed report
< Back
Next >
Cancel

Feature Rules

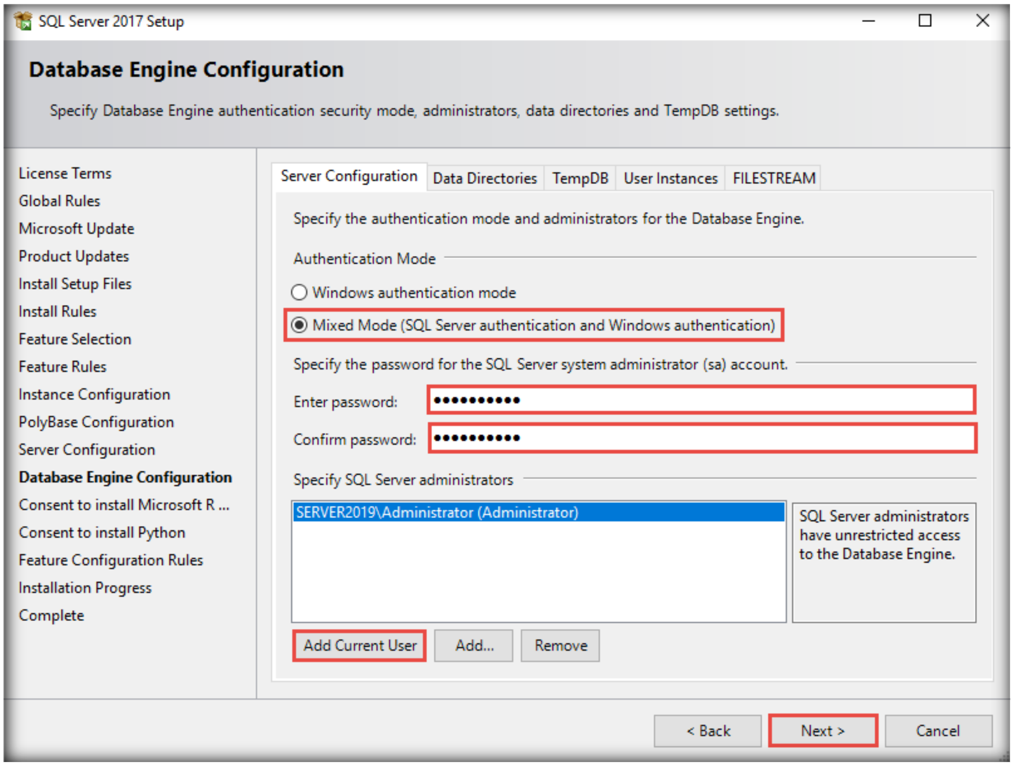
Setup is running rules to determine if the installation process will be blocked.

Operation completed. Passed: 4. Failed 0. Warning 0. Skipped 0.

| | Rule | Status |
|---|---|---|
| ✓ | Oracle JRE 7 Update 51 (64-bit) or higher is required for Polybase | Passed |
| ✓ | PolyBase can be installed on only one SQL Server instance per c... | Passed |
| ✓ | PolyBase cannot be installed on an Active Directory Domain Co... | Passed |
| ✓ | KB2919355 Installation | Passed |

15. In the **Instance Configuration** section, check that **Named instance** is specified. Leave the **Instance ID** option set to default and click **Next** to continue.
16. The **PolyBase Configuration** section appears. Ensure that the **Use this SQL Server as standalone PolyBase-enabled instance** option is selected and click **Next**.
17. The **Server Configuration** section appears. Leave the Account Names and Passwords set to default and click **Next**.
18. The **Database Engine Configuration** section appears; select the **Mixed Mode (SQL Server authentication and Window authentication)** radio button and input the password **qwerty@123** in both the **Enter password** and **Confirm password** text fields.

19. Click the **Add Current User** button. You are added as the user (here, Administrator) and are displayed in the **Specify SQL Server administrators** section. Then, click **Next**.



SQL Server 2017 Setup
License Terms
Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Feature Selection
Feature Rules
Instance Configuration
PolyBase Configuration
Server Configuration
Database Engine Configuration
Consent to install Microsoft R ...
Consent to install Python
Feature Configuration Rules
Installation Progress
Complete
Server Configuration
Data Directories
TempDB
User Instances
FILESTREAM
Add Current User
Add...
Remove
< Back
Next >
Cancel

**Database Engine Configuration**

Specify Database Engine authentication security mode, administrators, data directories and TempDB settings.

Specify the authentication mode and administrators for the Database Engine.

Authentication Mode

○ Windows authentication mode

● Mixed Mode (SQL Server authentication and Windows authentication)

Specify the password for the SQL Server system administrator (sa) account.

Enter password: ••••••••••

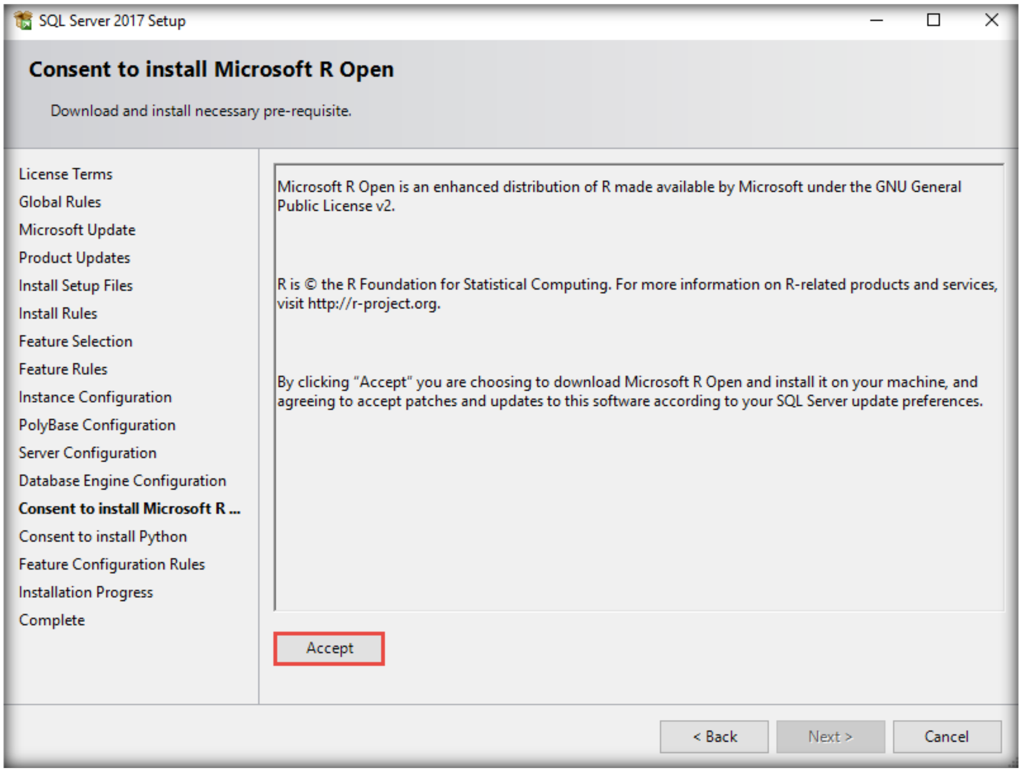
Confirm password: ••••••••••

Specify SQL Server administrators

SERVER2019\Administrator (Administrator)

SQL Server administrators have unrestricted access to the Database Engine.

20. The **Consent to install Microsoft R Open** section appears. Click the **Accept** button, and then click **Next**.



SQL Server 2017 Setup
License Terms
Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Feature Selection
Feature Rules
Instance Configuration
PolyBase Configuration
Server Configuration
Database Engine Configuration
Consent to install Microsoft R ...
Consent to install Python
Feature Configuration Rules
Installation Progress
Complete
Accept
< Back
Next >
Cancel

**Consent to install Microsoft R Open**

Download and install necessary pre-requisite.

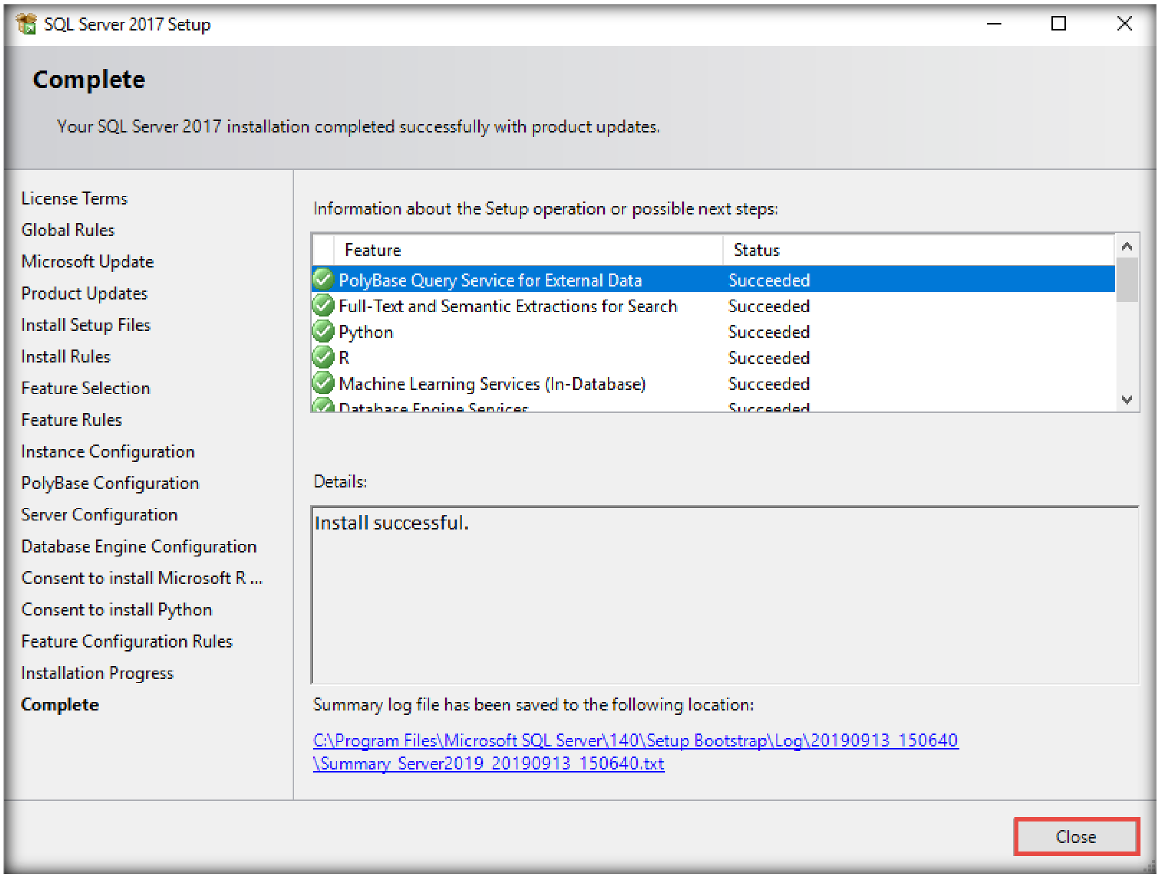
Microsoft R Open is an enhanced distribution of R made available by Microsoft under the GNU General Public License v2.

R is © the R Foundation for Statistical Computing. For more information on R-related products and services, visit http://r-project.org.

By clicking "Accept" you are choosing to download Microsoft R Open and install it on your machine, and agreeing to accept patches and updates to this software according to your SQL Server update preferences.

21. The **Consent to install Python** section appears; click the **Accept** button, and then click **Next.**
22. The setup starts to install the SQL server, showing you the progress in the **Installation Progress** section.
23. Wait for the installation to complete.

    **Note**: If a **Computer restart required** pop-up appears, click **OK**.
24. The **Complete** window appears, providing a link that redirects to the location of the summary log file for the installation and other **important notes**.
25. Click **Close** to finish the installation setup.


SQL Server 2017 Setup
Complete
License Terms
Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Feature Selection
Feature Rules
Instance Configuration
PolyBase Configuration
Server Configuration
Database Engine Configuration
Consent to install Microsoft R ...
Consent to install Python
Feature Configuration Rules
Installation Progress
Complete
Close

Your SQL Server 2017 installation completed successfully with product updates.

Information about the Setup operation or possible next steps:

| Feature | Status |
|---|---|
| PolyBase Query Service for External Data | Succeeded |
| Full-Text and Semantic Extractions for Search | Succeeded |
| Python | Succeeded |
| R | Succeeded |
| Machine Learning Services (In-Database) | Succeeded |
| Database Engine Services | Succeeded |

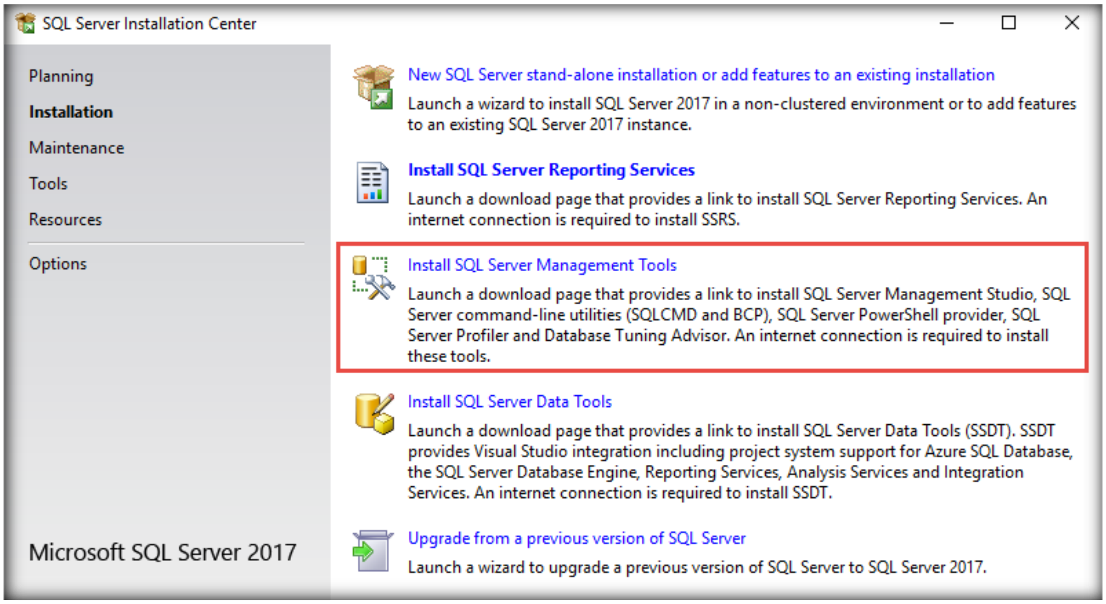
Details:

Install successful.

Summary log file has been saved to the following location:

C:\Program Files\Microsoft SQL Server\140\Setup Bootstrap\Log\20190913_150640
\Summary_Server2019_20190913_150640.txt

26. Switch to the **SQL Server Installation Center** window and click the **Install SQL Server Management Tools** link.


SQL Server Installation Center
Planning
Installation
Maintenance
Tools
Resources
Options
Microsoft SQL Server 2017

New SQL Server stand-alone installation or add features to an existing installation

Launch a wizard to install SQL Server 2017 in a non-clustered environment or to add features to an existing SQL Server 2017 instance.

Install SQL Server Reporting Services

Launch a download page that provides a link to install SQL Server Reporting Services. An internet connection is required to install SSRS.

Install SQL Server Management Tools

Launch a download page that provides a link to install SQL Server Management Studio, SQL Server command-line utilities (SQLCMD and BCP), SQL Server PowerShell provider, SQL Server Profiler and Database Tuning Advisor. An internet connection is required to install these tools.

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Launch a download page that provides a link to install SQL Server Data Tools (SSDT). SSDT provides Visual Studio integration including project system support for Azure SQL Database, the SQL Server Database Engine, Reporting Services, Analysis Services and Integration Services. An internet connection is required to install SSDT.

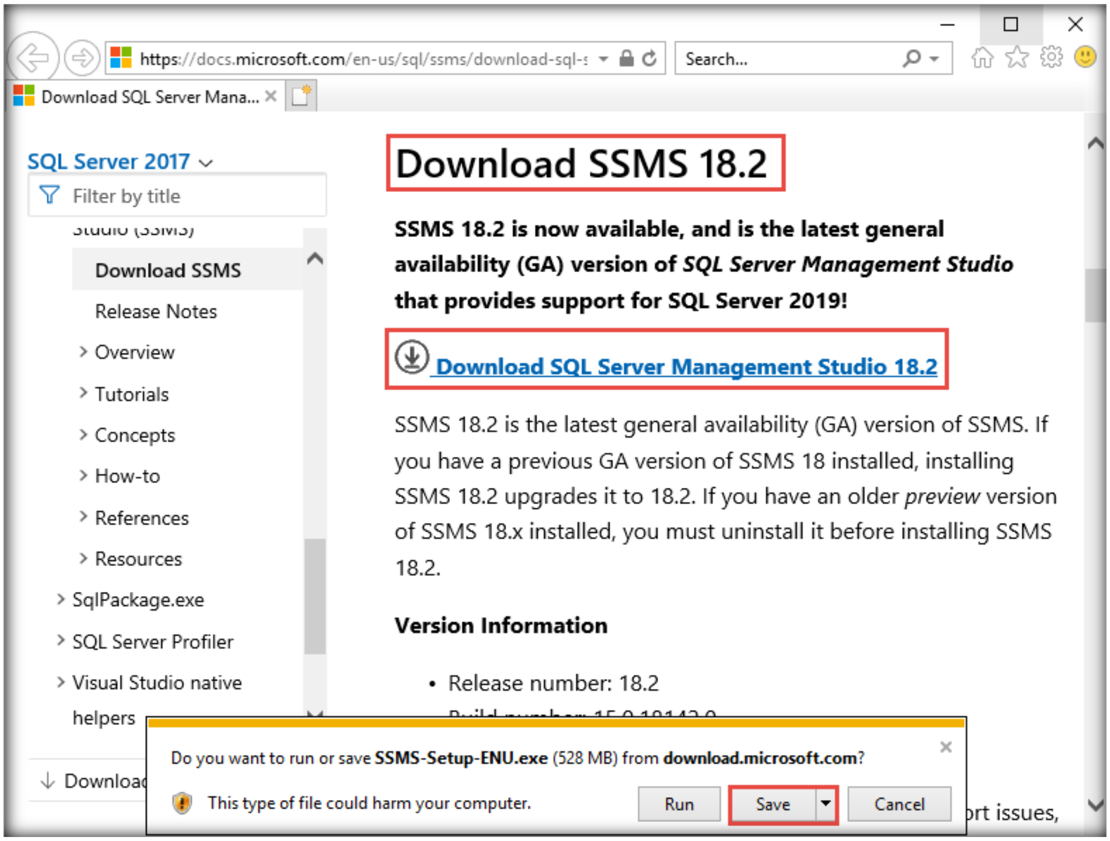
Upgrade from a previous version of SQL Server

Launch a wizard to upgrade a previous version of SQL Server to SQL Server 2017.

27. The link opens in your browser; scroll-down to **Download SSMS 18.2** and click **Download SQL Server Management Studio 18.2**. Save the file in your system.

**Note**: If an **Internet Explorer 11** notification appears, click **Ask me later**.

**Note**: The software version may vary in your lab environment.


https://docs.microsoft.com/en-us/sql/ssms/download-sql-s
Search...
Download SQL Server Mana...
SQL Server 2017
Filter by title
Download SSMS
Release Notes
Overview
Tutorials
Concepts
How-to
References
Resources
SqlPackage.exe
SQL Server Profiler
Visual Studio native helpers
Download
Run
Save
Cancel

Download SSMS 18.2

**SSMS 18.2 is now available, and is the latest general availability (GA) version of *SQL Server Management Studio* that provides support for SQL Server 2019!**

Download SQL Server Management Studio 18.2

SSMS 18.2 is the latest general availability (GA) version of SSMS. If you have a previous GA version of SSMS 18 installed, installing SSMS 18.2 upgrades it to 18.2. If you have an older *preview* version of SSMS 18.x installed, you must uninstall it before installing SSMS 18.2.

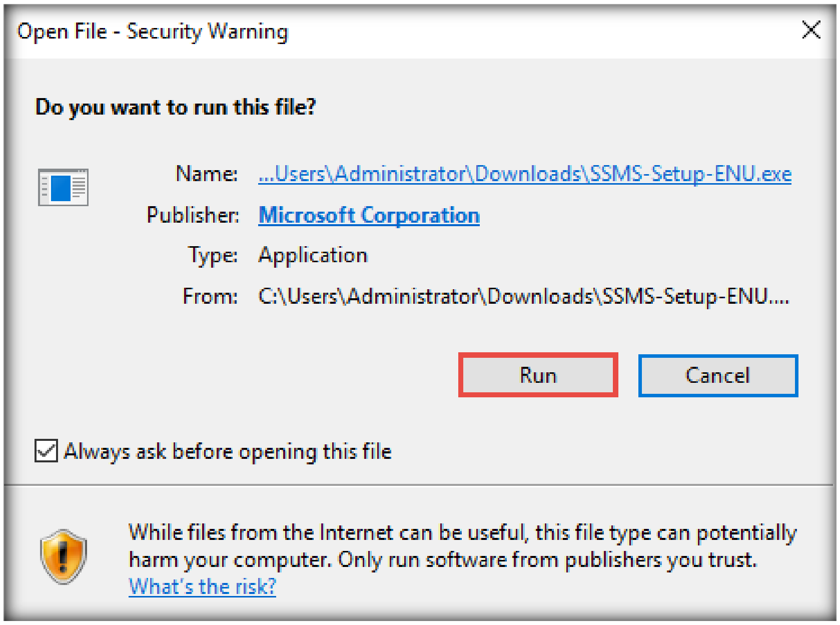
**Version Information**

- Release number: 18.2

Do you want to run or save **SSMS-Setup-ENU.exe** (528 MB) from **download.microsoft.com**?

This type of file could harm your computer.

28. Open your downloads folder and double-click the application downloaded in the previous step. Click **Run** if a security warning pop-up appears.



Open File - Security Warning

Do you want to run this file?

Name: ...Users\Administrator\Downloads\SSMS-Setup-ENU.exe

Publisher: Microsoft Corporation

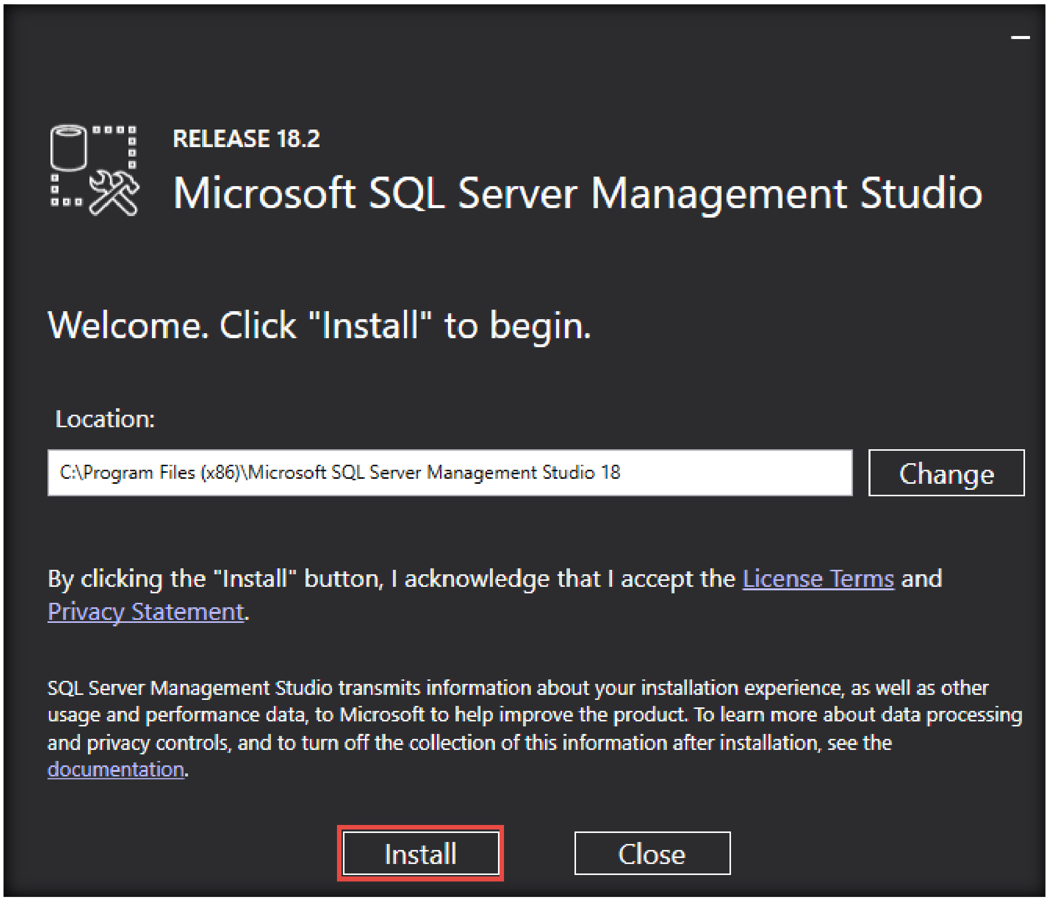
Type: Application

From: C:\Users\Administrator\Downloads\SSMS-Setup-ENU....

☑ Always ask before opening this file

While files from the Internet can be useful, this file type can potentially harm your computer. Only run software from publishers you trust. What's the risk?

29. The **Microsoft SQL Server Management Studio** welcome screen appears; click **Install** to begin the setup.



RELEASE 18.2

Microsoft SQL Server Management Studio

Welcome. Click "Install" to begin.

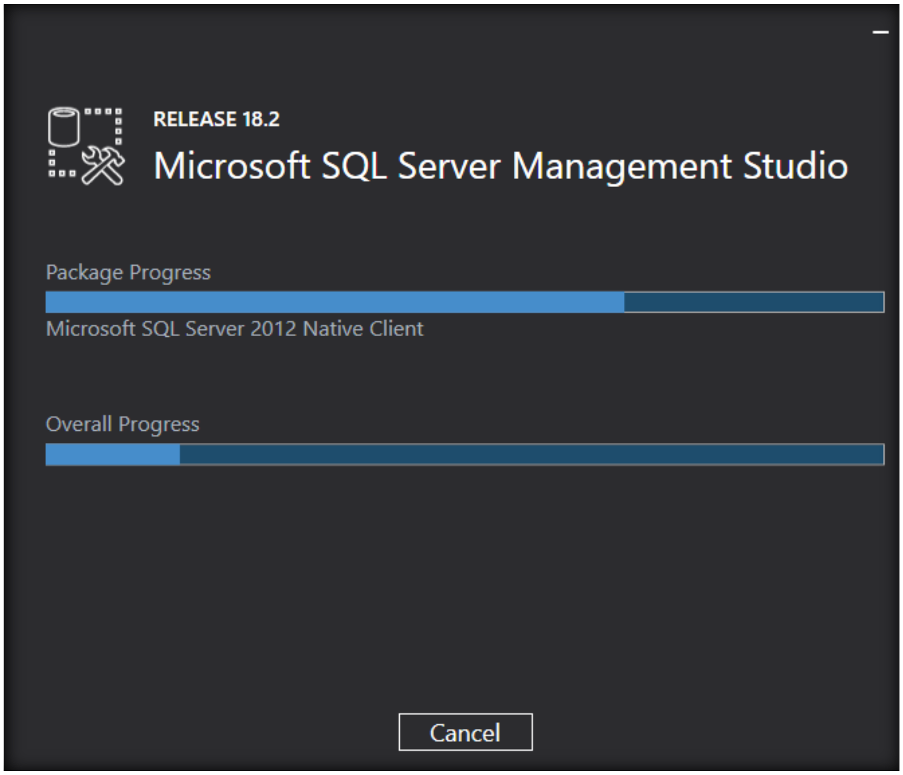
Location:

C:\Program Files (x86)\Microsoft SQL Server Management Studio 18

By clicking the "Install" button, I acknowledge that I accept the License Terms and Privacy Statement.

SQL Server Management Studio transmits information about your installation experience, as well as other usage and performance data, to Microsoft to help improve the product. To learn more about data processing and privacy controls, and to turn off the collection of this information after installation, see the documentation.

30. Microsoft SQL Server Management Studio begins its setup. Wait for the setup to finish.



RELEASE 18.2

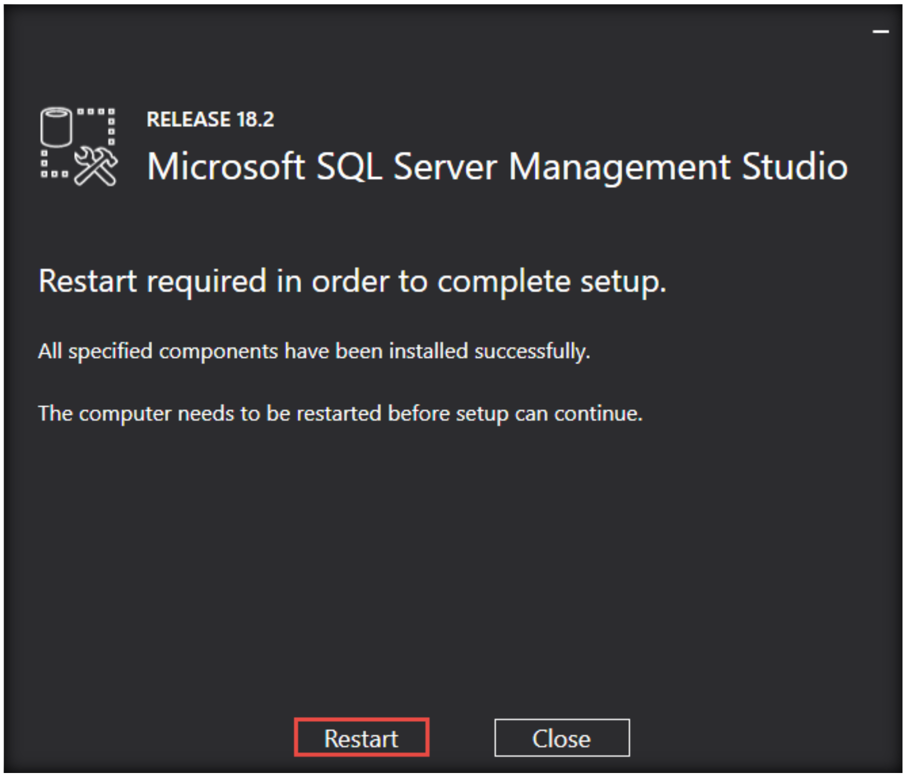
Microsoft SQL Server Management Studio

Package Progress

Microsoft SQL Server 2012 Native Client

Overall Progress

31. The **Microsoft SQL Server Management Studio** setup completed screen appears; click **Restart** to complete the installation.



RELEASE 18.2

Microsoft SQL Server Management Studio

Restart required in order to complete setup.

All specified components have been installed successfully.

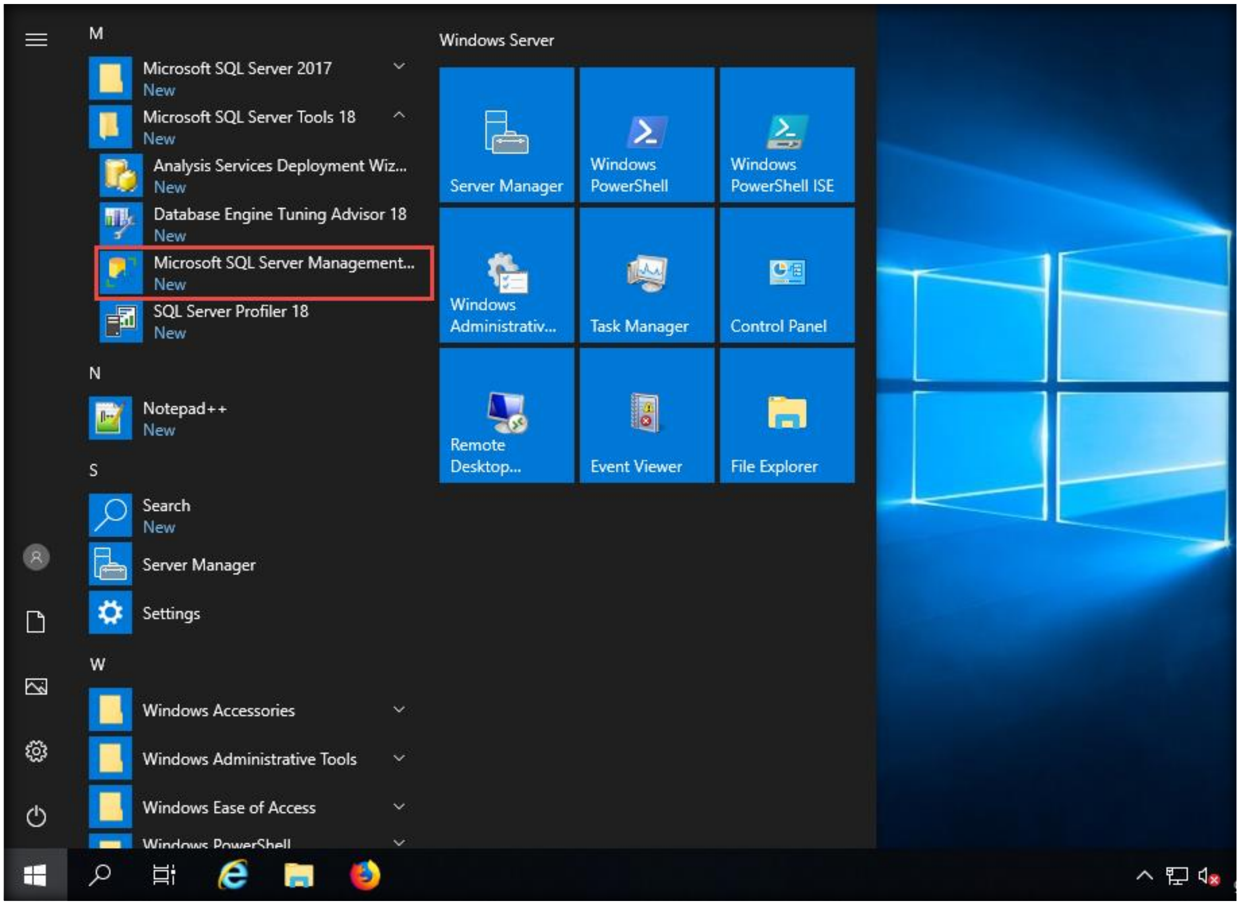
The computer needs to be restarted before setup can continue.

32. The system will restart.
33. After the system reboots, log in to the **Windows Server 2019** virtual machine with the credentials **Administrator** and **Pa$$w0rd**

**Important Note:**

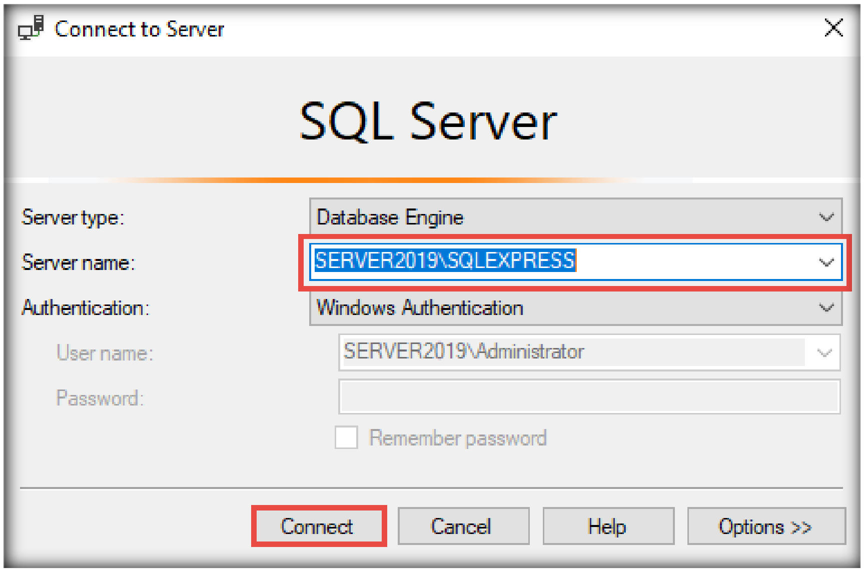
To execute **XP command shell scripts** in the CEH demo websites, you need to run the below query in your **SQL Server Management Studio**. Otherwise, none of the XP command shell lab exercise will properly work.

1. To launch **SQL Server Management Studio**, click the **Windows** icon in the lower-left corner of the screen.
2. The **Start** menu appears. Click the **SQL Server Management Studio** icon to launch the application.


M
Microsoft SQL Server 2017
New
Microsoft SQL Server Tools 18
New
Analysis Services Deployment Wiz...
New
Database Engine Tuning Advisor 18
New
Microsoft SQL Server Management...
New
SQL Server Profiler 18
New
N
Notepad++
New
S
Search
New
Server Manager
Settings
W
Windows Accessories
Windows Administrative Tools
Windows Ease of Access
Windows PowerShell
Windows Server
Server Manager
Windows PowerShell
Windows PowerShell ISE
Windows Administrativ...
Task Manager
Control Panel
Remote Desktop...
Event Viewer
File Explorer

3. The Main window of **SQL Server Management Studio** appears along with a **Connect to Server** dialog box.

4. Ensure that the name of the Windows machine is pre-written in the **Server name** field and click **Connect**.



Connect to Server

SQL Server

Server type: Database Engine

Server name: SERVER2019\SQLEXPRESS

Authentication: Windows Authentication

User name: SERVER2019\Administrator

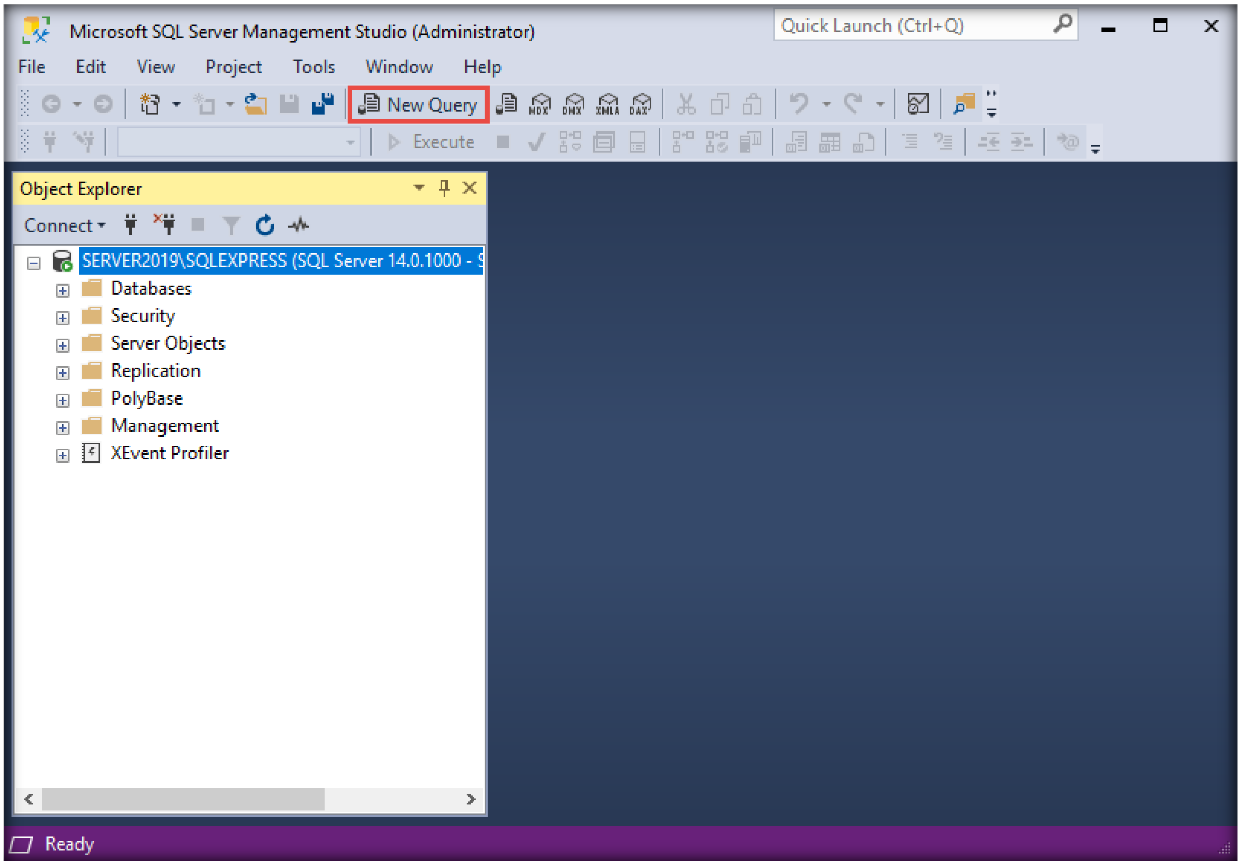
Password:

☐ Remember password

Connect
Cancel
Help
Options >>

**Note**: If the server name is not already written, then navigate to **Control Panel → All Control Panel Items → System**, make a note of the machine's name written in the **Computer name** field, and write it in the **Server name** field of the **Connect to Server** dialog box.

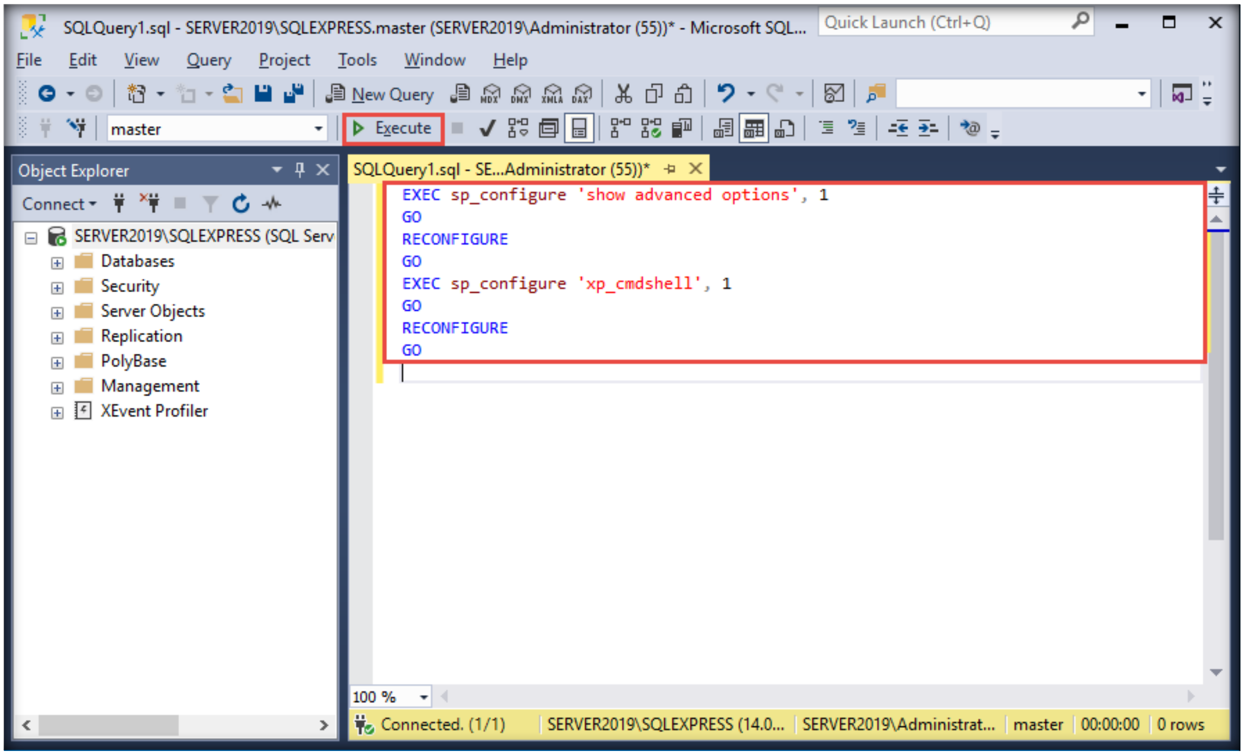
5. When the server is connected, click the **New Query** button from the menu bar.



Microsoft SQL Server Management Studio (Administrator)
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Tools
Window
Help
New Query
Execute
Object Explorer
Connect
SERVER2019\SQLEXPRESS (SQL Server 14.0.1000 -
Databases
Security
Server Objects
Replication
PolyBase
Management
XEvent Profiler
Ready

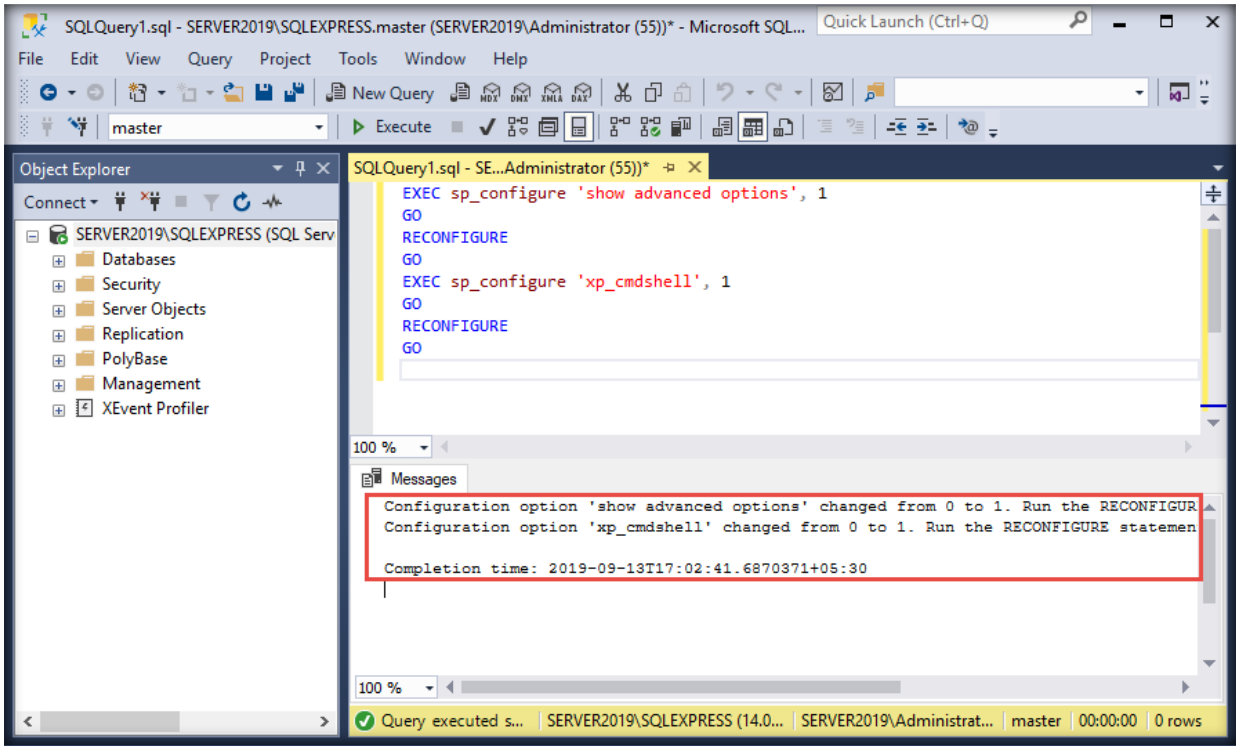
6. The **SQL Query** window appears in the right pane of the window.
7. Now, in this query page, type the below **query**, and then click the **Execute** button.

```
EXEC sp_configure 'show advanced options', 1
GO
RECONFIGURE
GO
EXEC sp_configure 'xp_cmdshell', 1
GO
RECONFIGURE
GO
```


SQLQuery1.sql - SERVER2019\SQLEXPRESS.master (SERVER2019\Administrator (55))* - Microsoft SQL...
Quick Launch (Ctrl+Q)
File
Edit
View
Query
Project
Tools
Window
Help
New Query
master
Execute
Object Explorer
Connect
SERVER2019\SQLEXPRESS (SQL Serv
Databases
Security
Server Objects
Replication
PolyBase
Management
XEvent Profiler
SQLQuery1.sql - SE...Administrator (55))*
100 %
Connected. (1/1)
SERVER2019\SQLEXPRESS (14.0...
SERVER2019\Administrat...
master
00:00:00
0 rows

```
EXEC sp_configure 'show advanced options', 1
GO
RECONFIGURE
GO
EXEC sp_configure 'xp_cmdshell', 1
GO
RECONFIGURE
GO
```

8. After the query is successfully executed, close **SQL Server Management Studio**.


SQLQuery1.sql - SERVER2019\SQLEXPRESS.master (SERVER2019\Administrator (55))* - Microsoft SQL...
Quick Launch (Ctrl+Q)
File
Edit
View
Query
Project
Tools
Window
Help
New Query
master
Execute
Object Explorer
Connect
SERVER2019\SQLEXPRESS (SQL Serv
Databases
Security
Server Objects
Replication
PolyBase
Management
XEvent Profiler
SQLQuery1.sql - SE...Administrator (55))*
100 %
Messages
Query executed s...
SERVER2019\SQLEXPRESS (14.0...
SERVER2019\Administrat...
master
00:00:00
0 rows

```
EXEC sp_configure 'show advanced options', 1
GO
RECONFIGURE
GO
EXEC sp_configure 'xp_cmdshell', 1
GO
RECONFIGURE
GO
```

```
Configuration option 'show advanced options' changed from 0 to 1. Run the RECONFIGUR
Configuration option 'xp_cmdshell' changed from 0 to 1. Run the RECONFIGURE statemen

Completion time: 2019-09-13T17:02:41.6870371+05:30
```

9. If prompted to save the query, click **No** and **exit** from SQL Server Management Studio.

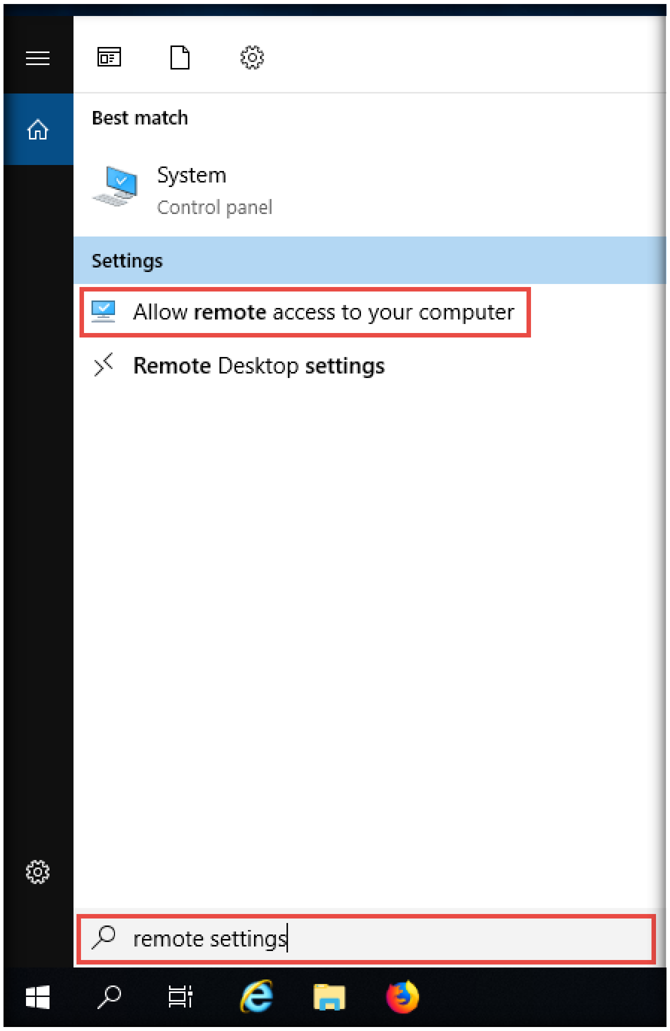
[Back to Configuration Task Outline]

# CT#32: Enable a Remote Desktop Connection on all Windows Virtual Machines

## Windows Server 2019

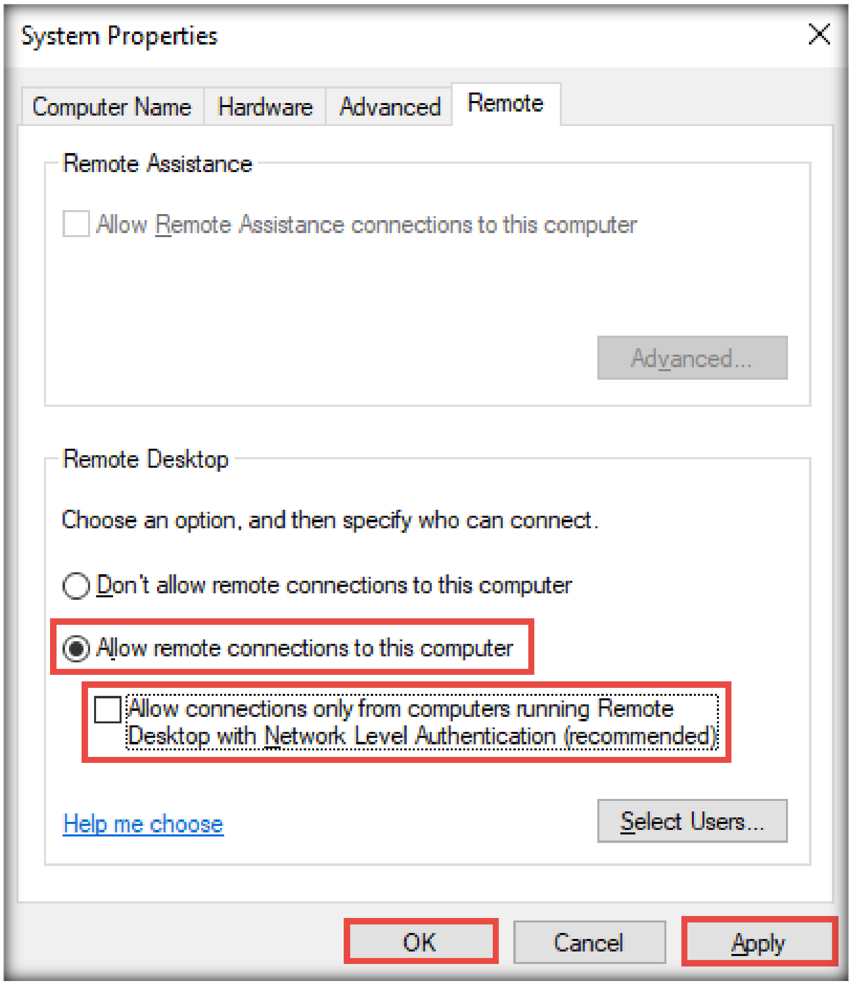
To enable a remote desktop connection on **Windows Server 2019**:

1. Log in to the **Windows Server 2019** virtual machine with the credentials **Administrator** and **Pa$$w0rd**.
2. Click the **Search** icon in the lower-left corner of the screen and type **remote settings** in the search field. Click the **Allow remote access to your computer** option returned in the search result.


Best match
System
Control panel
Settings
Allow remote access to your computer
Remote Desktop settings
remote settings

4. The **System Properties** dialog box appears; click the **Allow remote connections to this computer** radio button.
5. A **Remote Desktop Connection** pop-up appears. Click **OK**.
6. Observe that **Allow connections only from computers running Remote Desktop with Network Level Authentication (recommended)** is checked. Uncheck this option.

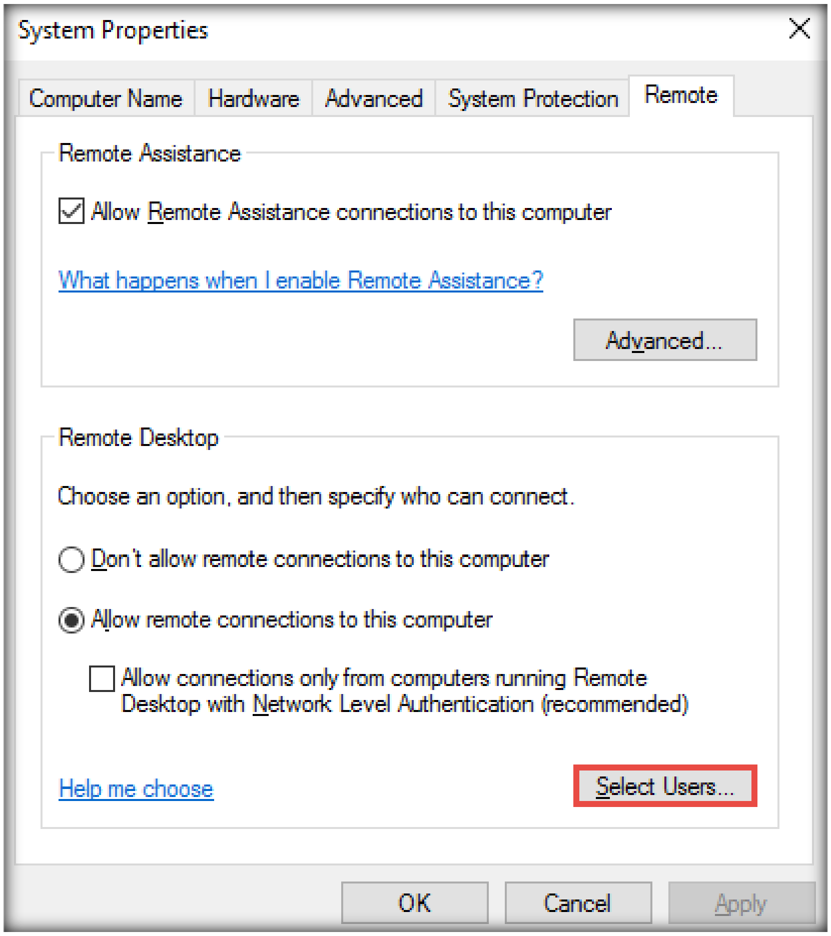
7. Click **Apply** and then click **OK**.


System Properties
Computer Name
Hardware
Advanced
Remote
Remote Assistance
☐ Allow Remote Assistance connections to this computer
Advanced...
Remote Desktop
Choose an option, and then specify who can connect.
○ Don't allow remote connections to this computer
● Allow remote connections to this computer
☐ Allow connections only from computers running Remote Desktop with Network Level Authentication (recommended)
Help me choose
Select Users...
OK
Cancel
Apply

8. Similarly, enable a remote desktop connection on the **Windows Server 2016** and **Windows 10** virtual machines.

9. On the **Windows 10** virtual machine, make the below changes:

   - Click the **Type here to search** field in the lower-left corner of the screen and type **Allow remote connections to this computer** in the search field. Click the **Allow remote connections to this computer** option returned in the search result.
   - The **Settings** window appears; under the **Remote Desktop** section, click **Show settings**.
   - The **System Properties** dialog box appears; click the **Allow remote connections to this computer** radio button.
   - A **Remote Desktop** pop-up appears. Click **OK**.
   - Observe that **Allow connections only from computers running Remote Desktop with Network Level Authentication (recommended)** is checked. Uncheck this option.
   - In the **System Properties** window, click **Select Users...**



System Properties

Remote Assistance

☑ Allow Remote Assistance connections to this computer

What happens when I enable Remote Assistance?

Remote Desktop

Choose an option, and then specify who can connect.

○ Don't allow remote connections to this computer

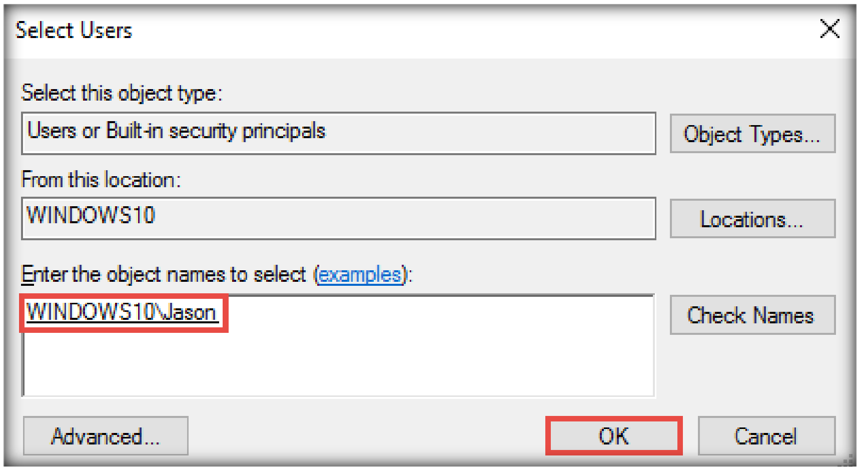
● Allow remote connections to this computer

☐ Allow connections only from computers running Remote Desktop with Network Level Authentication (recommended)

Help me choose

Computer Name
Hardware
Advanced
System Protection
Remote
Advanced...
Select Users...
OK
Cancel
Apply

- The **Remote Desktop Users** window appears. Click the **Add...** button.
- In **Select Users** window, type **WINDOWS10\Jason** in the **Enter the object names to select** field and click **OK**.



Select Users

Select this object type:
Users or Built-in security principals

From this location:
WINDOWS10

Enter the object names to select (examples):
WINDOWS10\Jason

Object Types...
Locations...
Check Names
Advanced...
OK
Cancel

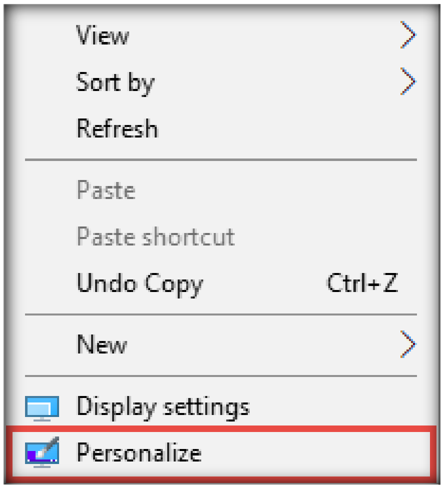
- Click **OK** in the **Remote Desktop Users** window.
- In the **System Properties** window, click **Apply** and then click **OK**.

[Back to Configuration Task Outline]

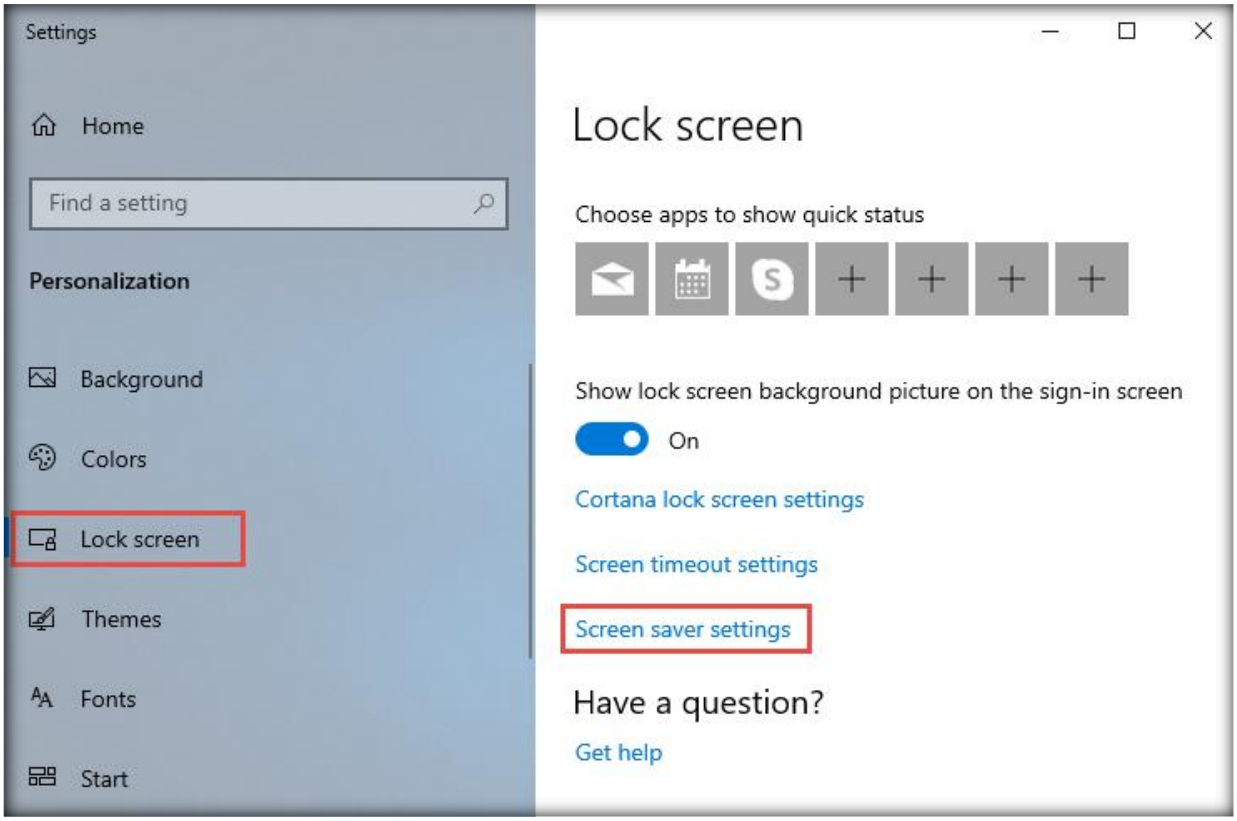
# CT#33: Turn Off Screen Savers on all Windows Virtual Machines

## Windows 10

1. In the **Windows 10** virtual machine, right-click on the **Desktop** and select **Personalize** to open the personalization settings.

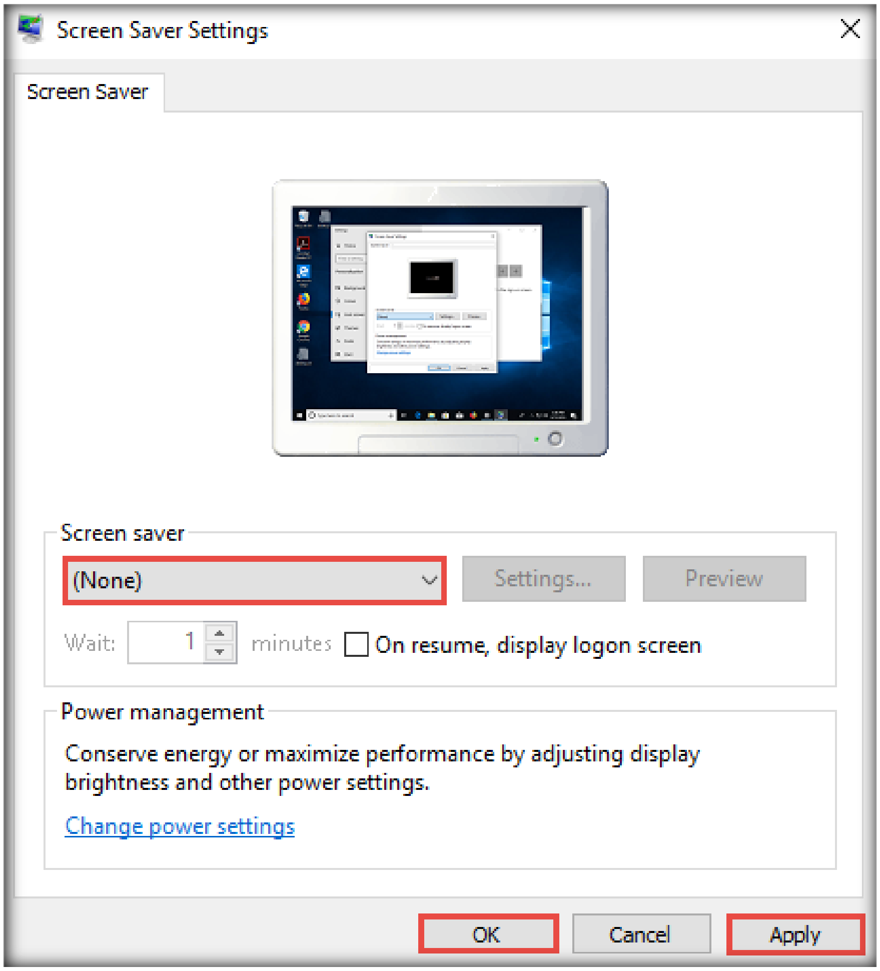

View
Sort by
Refresh
Paste
Paste shortcut
Undo Copy
Ctrl+Z
New
Display settings
Personalize

2. The **Settings** window appears. Click the **Lock screen** in the left pane. Scroll down the **Lock Screen** settings in the right pane and click on the **Screen saver settings** link.


Settings
Home
Find a setting
Personalization
Background
Colors
Lock screen
Themes
Fonts
Start
Lock screen
Choose apps to show quick status
Cortana lock screen settings
Screen timeout settings
Screen saver settings
Have a question?
Get help

Show lock screen background picture on the sign-in screen
On

3. The **Screen Saver Settings** window appears; ensure that the **(None)** option is selected from the drop-down list of **Screen saver**. Click **Apply**, and then click **OK**.


Screen Saver Settings
Screen Saver
Screen saver
(None)
Settings...
Preview
Wait: 1 minutes
☐ On resume, display logon screen
Power management
Conserve energy or maximize performance by adjusting display brightness and other power settings.
Change power settings
OK
Cancel
Apply

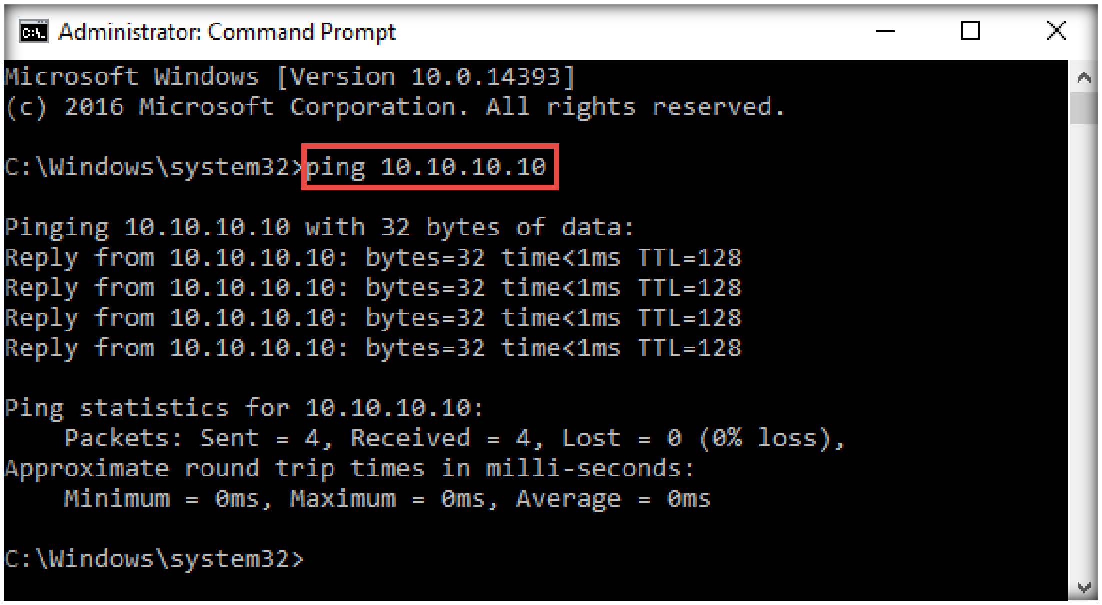
4. Close all windows.
5. Similarly, turn off the screen saver on **Windows Server 2019** and **Windows Server 2016**.

   **Note**: In some windows operating systems, such as Windows Server 2019, Windows Server 2016, and Windows 10, you cannot change the personalization settings unless your system is activated.

[Back to Configuration Task Outline]

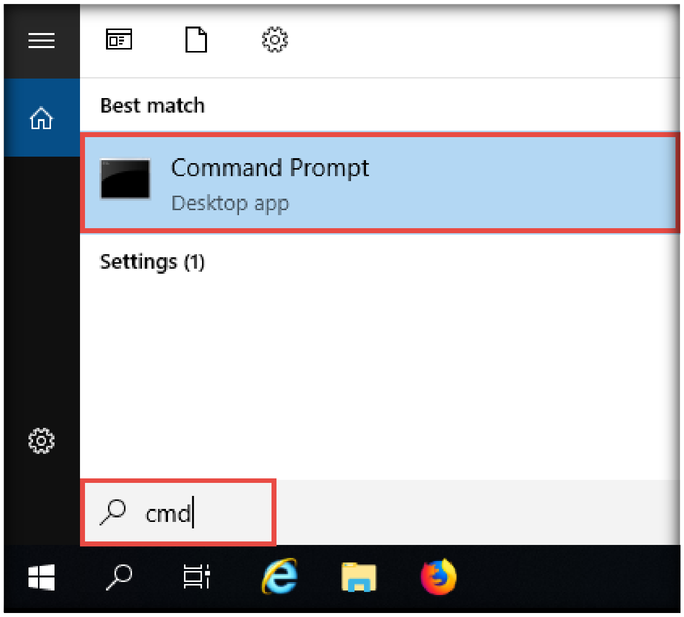
## CT#34: Ping Test Among all Virtual Machines

1. On the **Windows Server 2016** virtual machine, right-click the **Windows** icon in the lower-left corner of the screen and click **Command Prompt (Admin)**.
2. Before pinging the virtual machines, ensure that they are running.
3. Check for a reply from the virtual machines. Here, as an example, we are using the **Windows 10** virtual machine IP address **10.10.10.10** (this IP address may be different in your lab network).

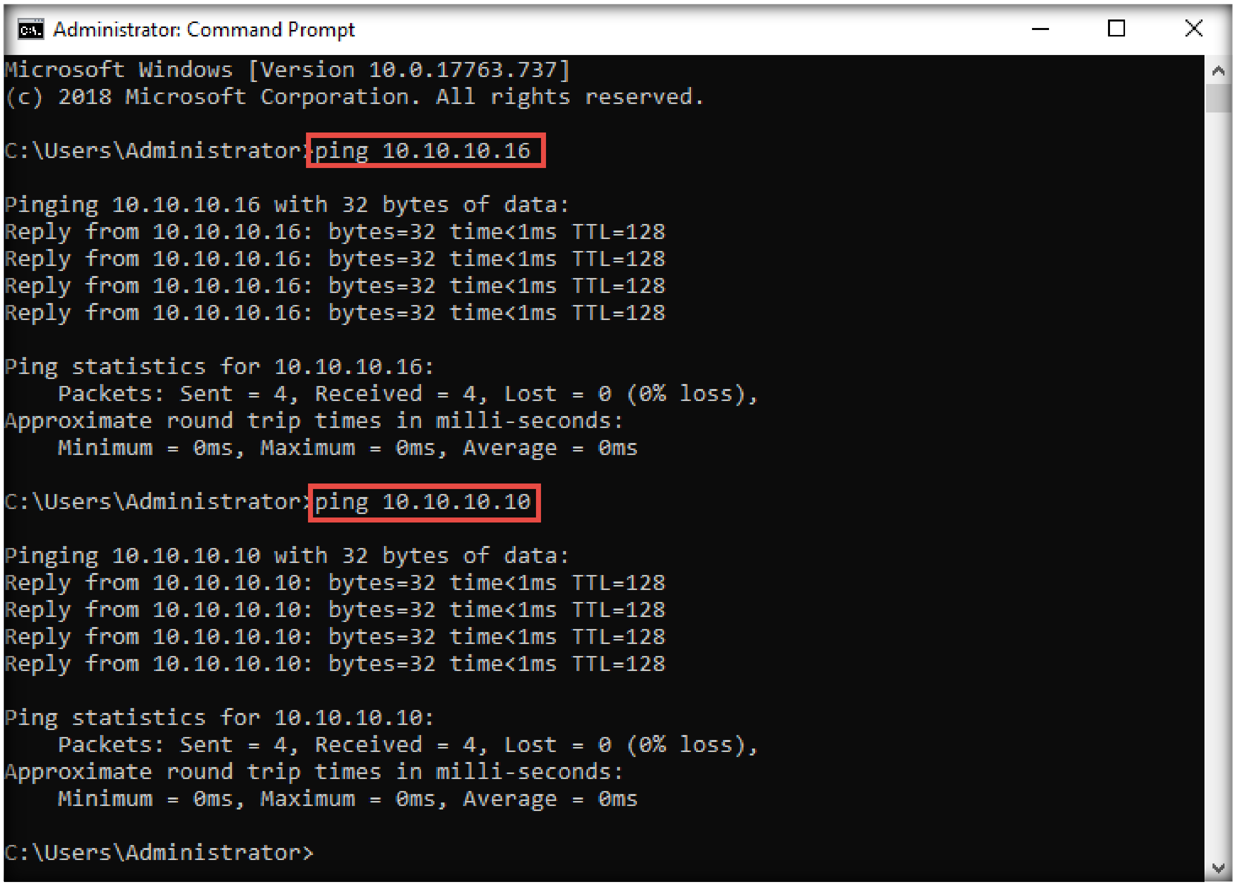


```
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Windows\system32>ping 10.10.10.10

Pinging 10.10.10.10 with 32 bytes of data:
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Windows\system32>
```

4. Open command prompt in another one of the **Virtual Machines**. Here, as an example, we are using the **Windows Server 2019** virtual machine.



5. Here, as an example, we are pinging **Windows Server 2016** and **Windows 10** from the **Windows Server 2019** (this IP address will be different in your lab network).



```
Microsoft Windows [Version 10.0.17763.737]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>ping 10.10.10.16

Pinging 10.10.10.16 with 32 bytes of data:
Reply from 10.10.10.16: bytes=32 time<1ms TTL=128
Reply from 10.10.10.16: bytes=32 time<1ms TTL=128
Reply from 10.10.10.16: bytes=32 time<1ms TTL=128
Reply from 10.10.10.16: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.10.16:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Administrator>ping 10.10.10.10

Pinging 10.10.10.10 with 32 bytes of data:
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Administrator>
```

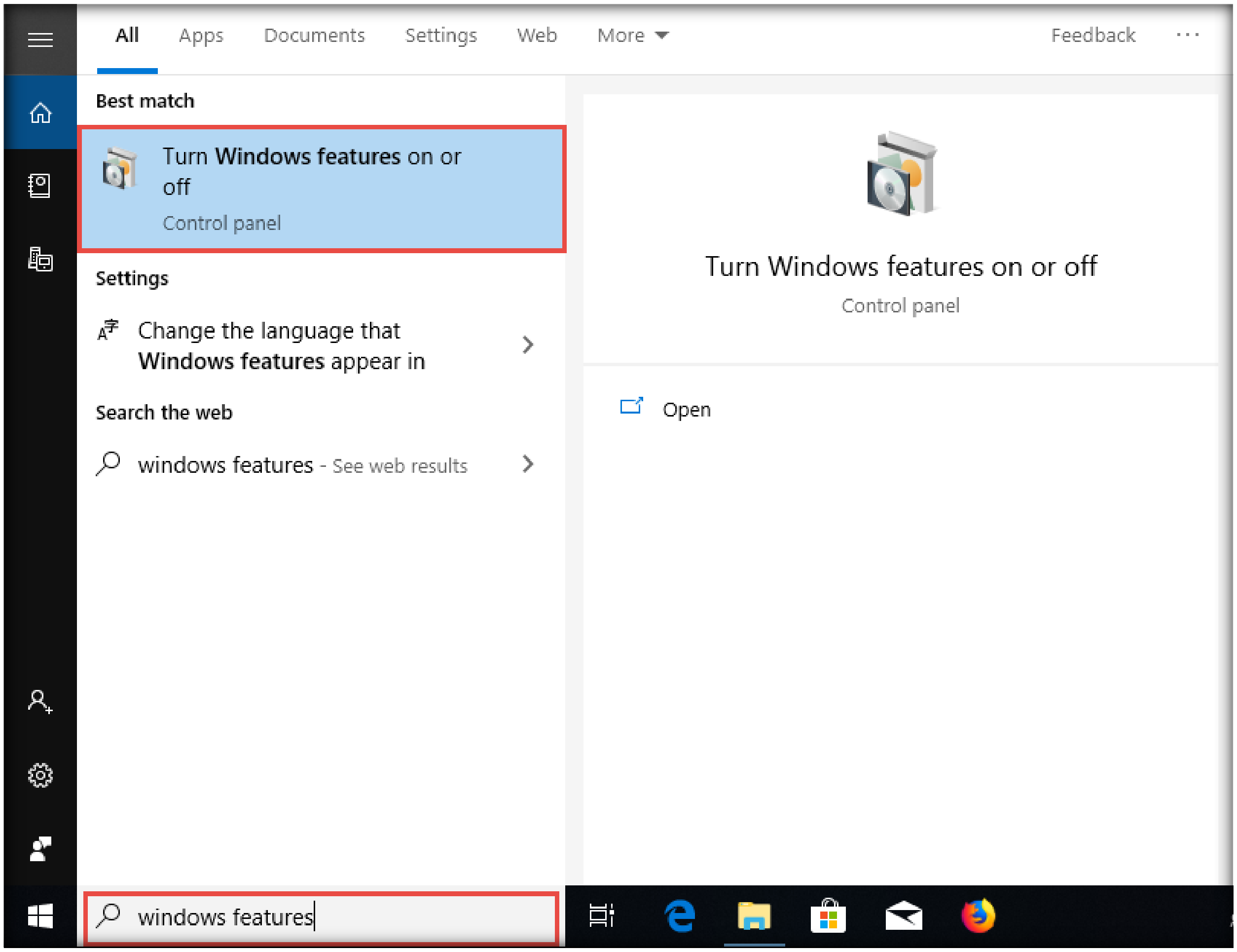
6. Open **Command Prompt** in one of your **Virtual Machines** and type the ping command as **Ping <IP address of Virtual Machine>**.

7. Repeat the above steps to ping all virtual machines (**Windows 10**, **Windows Server 2019**, **Windows Server 2016**, **Parrot Security**, **Ubuntu**, and **Android**).

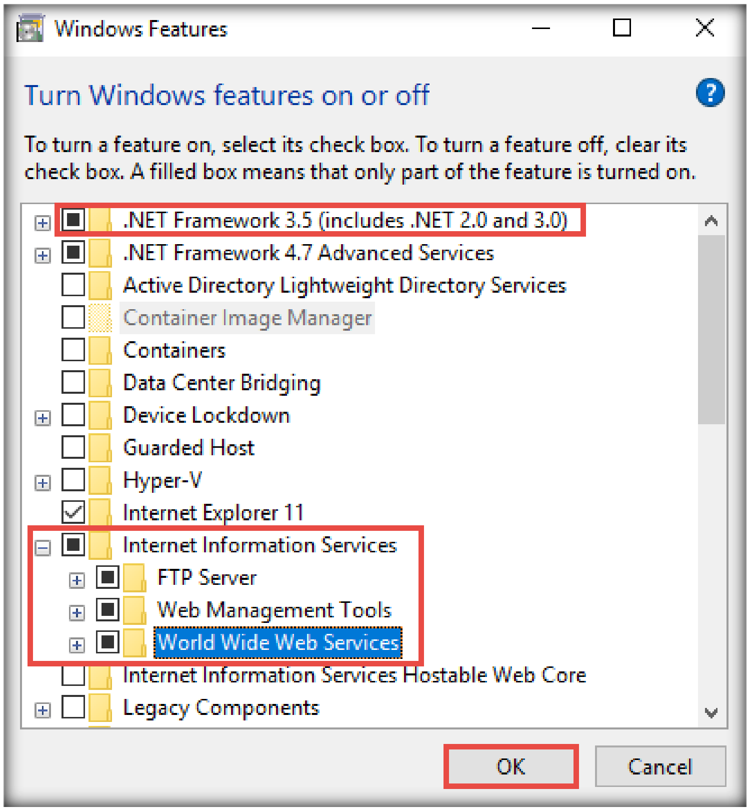
[Back to Configuration Task Outline]

# CT#35: Enable and Configure an FTP Server in the Windows 10 Virtual Machine

1. Log in to the **Windows 10** virtual machine. Click the **Search** icon in the taskbar and type **windows features** in the search field. Click **Turn Windows features on or off**, as shown in the screenshot.


All
Apps
Documents
Settings
Web
More
Feedback
Best match
Turn Windows features on or off
Control panel
Settings
Change the language that Windows features appear in
Search the web
windows features - See web results
Turn Windows features on or off
Control panel
Open
windows features

2. The **Windows Features** window appears. Check the **.NET Framework 3.5 (includes .NET 2.0 and 3.0)** checkbox and **FTP Server**, **Web Management Tools**, and **World Wide Web Services** checkboxes under **Internet Information Services**. Click **OK** to install these features.



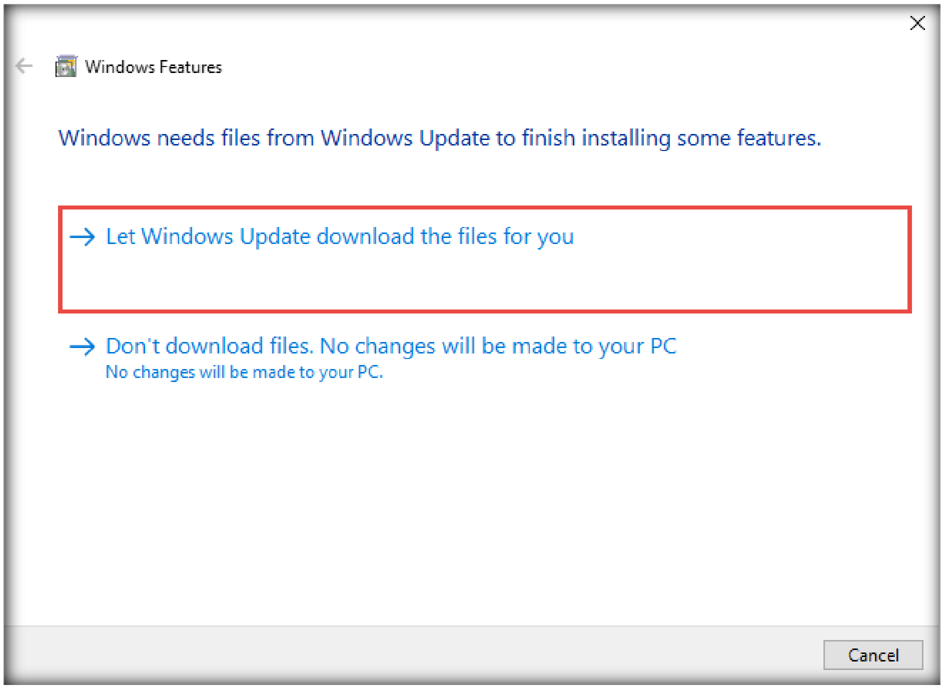
Windows Features

Turn Windows features on or off

To turn a feature on, select its check box. To turn a feature off, clear its check box. A filled box means that only part of the feature is turned on.

- ■ .NET Framework 3.5 (includes .NET 2.0 and 3.0)
- ■ .NET Framework 4.7 Advanced Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Container Image Manager
- ☐ Containers
- ☐ Data Center Bridging
- ☐ Device Lockdown
- ☐ Guarded Host
- ☐ Hyper-V
- ☑ Internet Explorer 11
- ■ Internet Information Services
  - ■ FTP Server
  - ■ Web Management Tools
  - ■ World Wide Web Services
- ☐ Internet Information Services Hostable Web Core
- ☐ Legacy Components

3. In the next window, click the **Let Windows Update download the files for you** link, as shown in the screenshot.



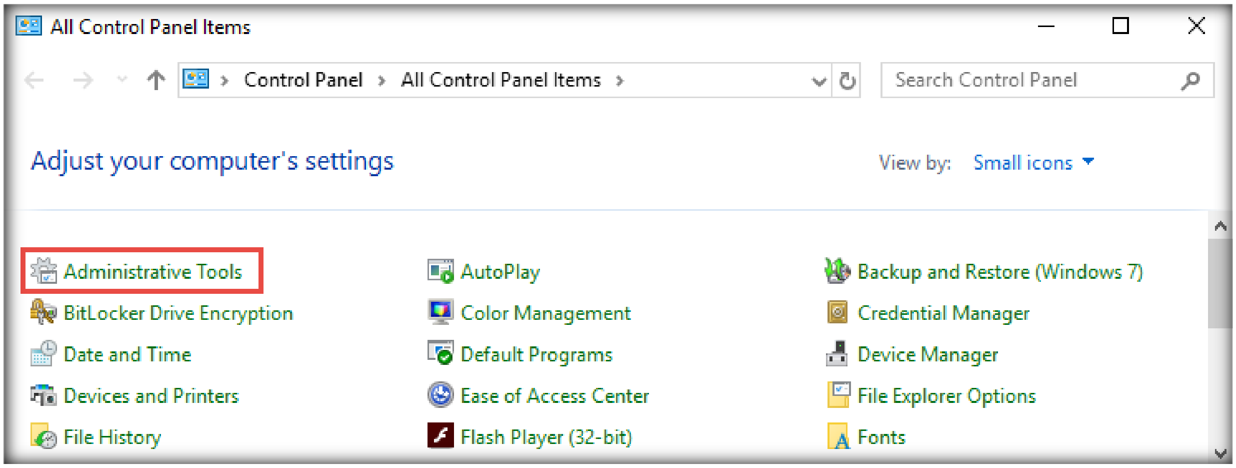
Windows Features

Windows needs files from Windows Update to finish installing some features.

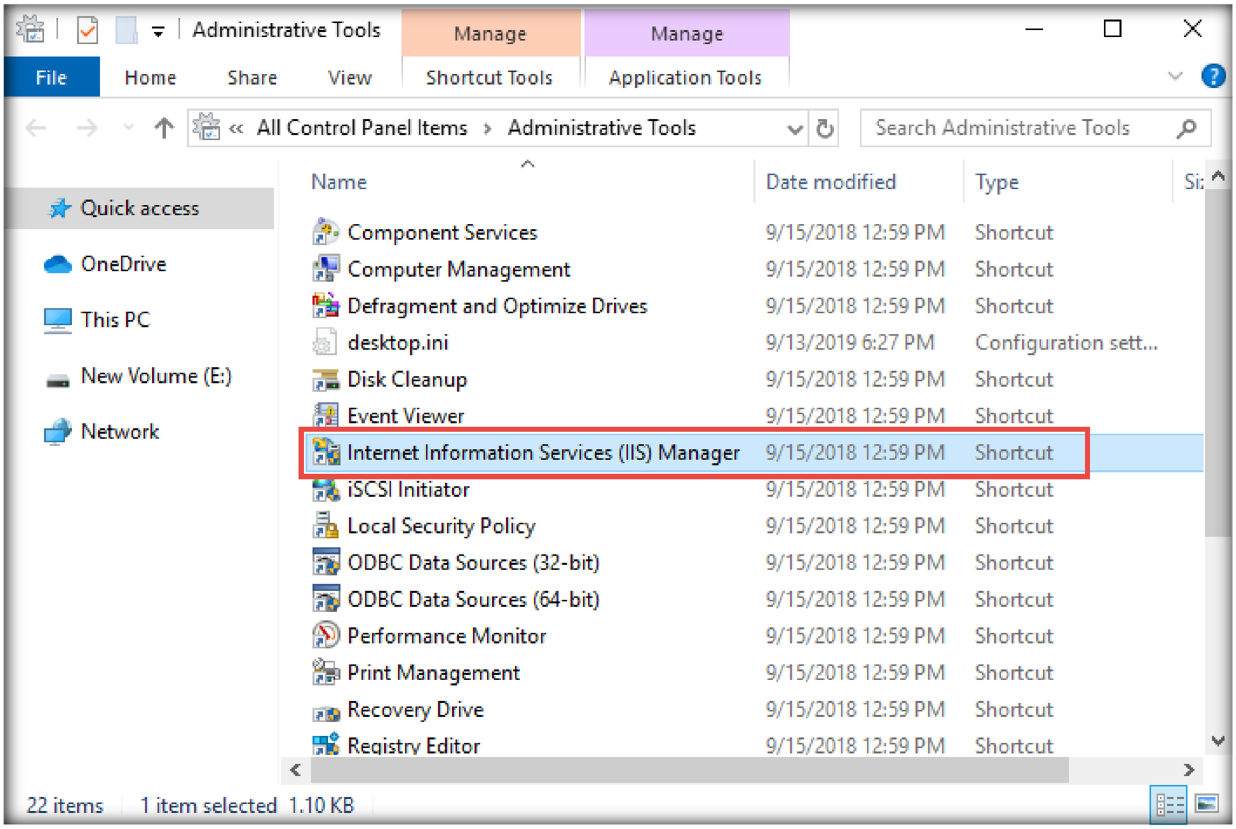
→ Let Windows Update download the files for you

→ Don't download files. No changes will be made to your PC
No changes will be made to your PC.

4. After the features have been successfully installed, click **Close** to exit the **Windows Features** window.
5. Once done, close all windows and restart the **Windows 10** virtual machine.
6. Once the Windows 10 machine has restarted, open **Control Panel**.
7. In the **Control Panel** window, select **View by** as **Small icons** under the **Category** drop-down options.
8. From the available options, click **Administrative Tools**.

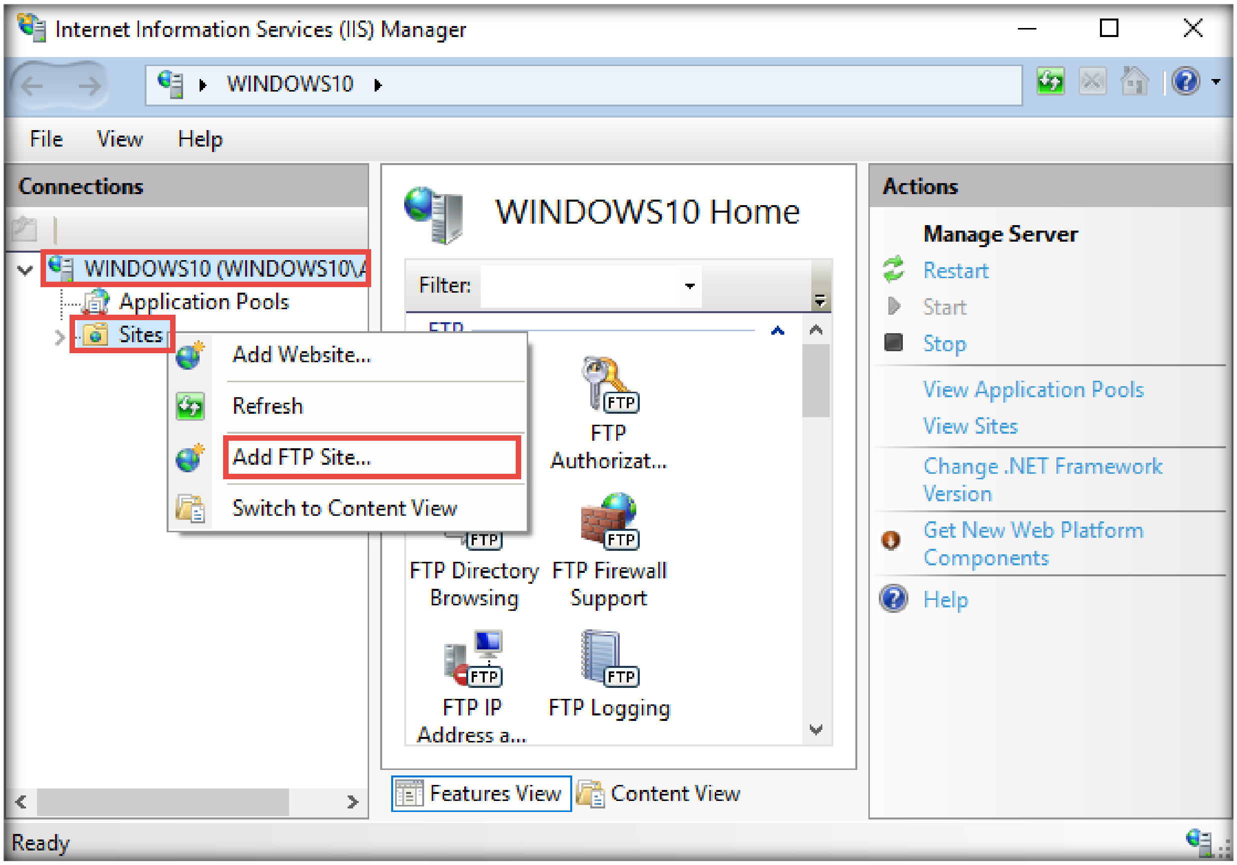

All Control Panel Items
Control Panel > All Control Panel Items >
Search Control Panel
Adjust your computer's settings
View by: Small icons
Administrative Tools
AutoPlay
Backup and Restore (Windows 7)
BitLocker Drive Encryption
Color Management
Credential Manager
Date and Time
Default Programs
Device Manager
Devices and Printers
Ease of Access Center
File Explorer Options
File History
Flash Player (32-bit)
Fonts

9. In the **Administrative Tools** window, double-click **Internet Information Services (IIS) Manager**.

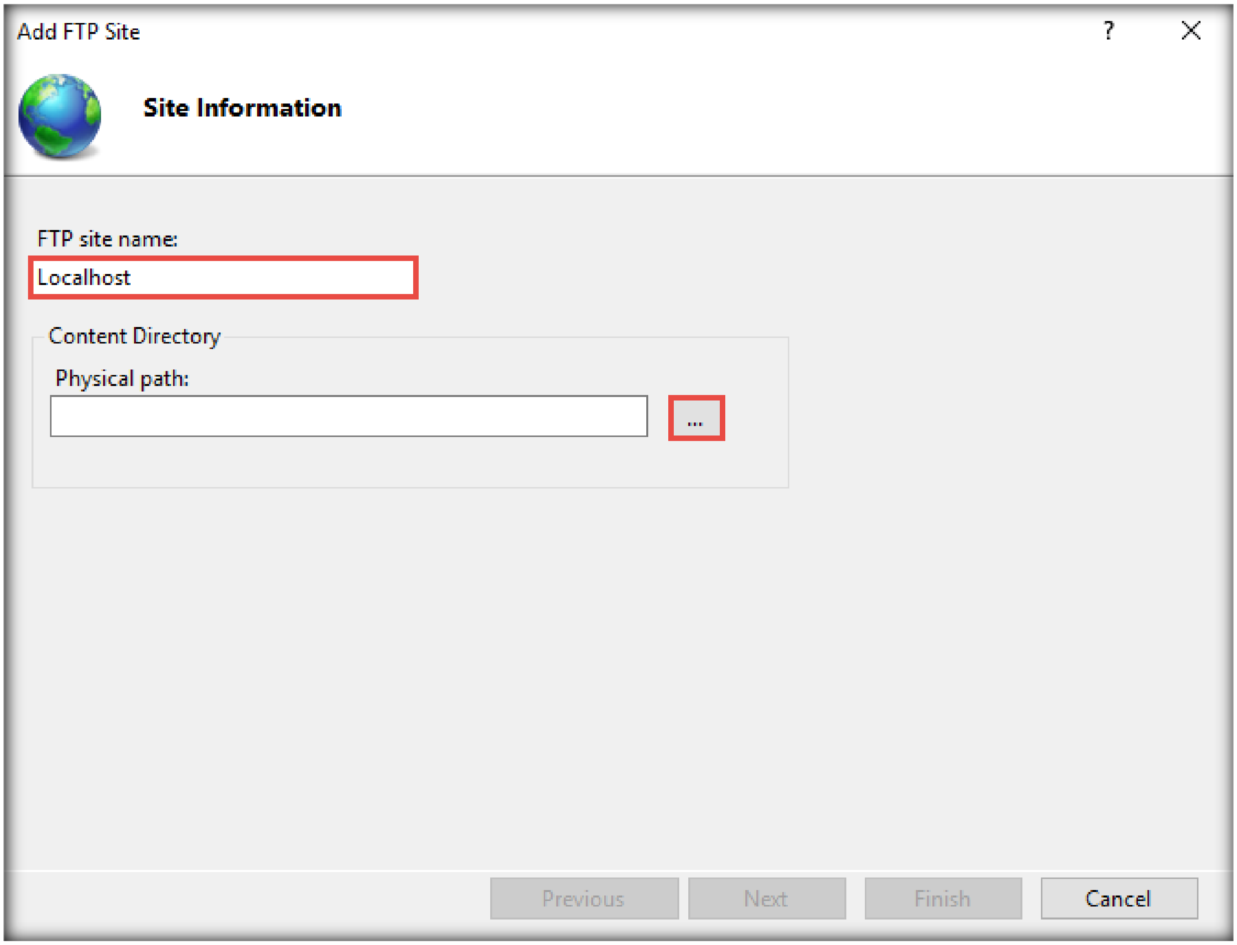

Administrative Tools
Manage
Manage
File
Home
Share
View
Shortcut Tools
Application Tools
« All Control Panel Items > Administrative Tools
Search Administrative Tools
Quick access
OneDrive
This PC
New Volume (E:)
Network
22 items
1 item selected 1.10 KB

| Name | Date modified | Type | Si: |
|---|---|---|---|
| Component Services | 9/15/2018 12:59 PM | Shortcut | |
| Computer Management | 9/15/2018 12:59 PM | Shortcut | |
| Defragment and Optimize Drives | 9/15/2018 12:59 PM | Shortcut | |
| desktop.ini | 9/13/2019 6:27 PM | Configuration sett... | |
| Disk Cleanup | 9/15/2018 12:59 PM | Shortcut | |
| Event Viewer | 9/15/2018 12:59 PM | Shortcut | |
| Internet Information Services (IIS) Manager | 9/15/2018 12:59 PM | Shortcut | |
| iSCSI Initiator | 9/15/2018 12:59 PM | Shortcut | |
| Local Security Policy | 9/15/2018 12:59 PM | Shortcut | |
| ODBC Data Sources (32-bit) | 9/15/2018 12:59 PM | Shortcut | |
| ODBC Data Sources (64-bit) | 9/15/2018 12:59 PM | Shortcut | |
| Performance Monitor | 9/15/2018 12:59 PM | Shortcut | |
| Print Management | 9/15/2018 12:59 PM | Shortcut | |
| Recovery Drive | 9/15/2018 12:59 PM | Shortcut | |
| Registry Editor | 9/15/2018 12:59 PM | Shortcut | |

10. The **Internet Information Services (IIS) Manager** window appears. Expand the root folder (**WINDOWS10 (WINDOWS10\Admin)**) from the left-hand pane, right-click **Sites**, and select **Add FTP Site...** from the context menu.


Internet Information Services (IIS) Manager
WINDOWS10
File
View
Help
Connections
WINDOWS10 (WINDOWS10\A
Application Pools
Sites
Add Website...
Refresh
Add FTP Site...
Switch to Content View
WINDOWS10 Home
Filter:
FTP
FTP Authorizat...
FTP Directory Browsing
FTP Firewall Support
FTP IP Address a...
FTP Logging
Features View
Content View
Actions
Manage Server
Restart
Start
Stop
View Application Pools
View Sites
Change .NET Framework Version
Get New Web Platform Components
Help
Ready

11. The **Add FTP Site** wizard appears. In the **FTP site name:** field, type **Localhost**; and in the **Content Directory** section, click the **Browse** button.



Add FTP Site
?
Site Information

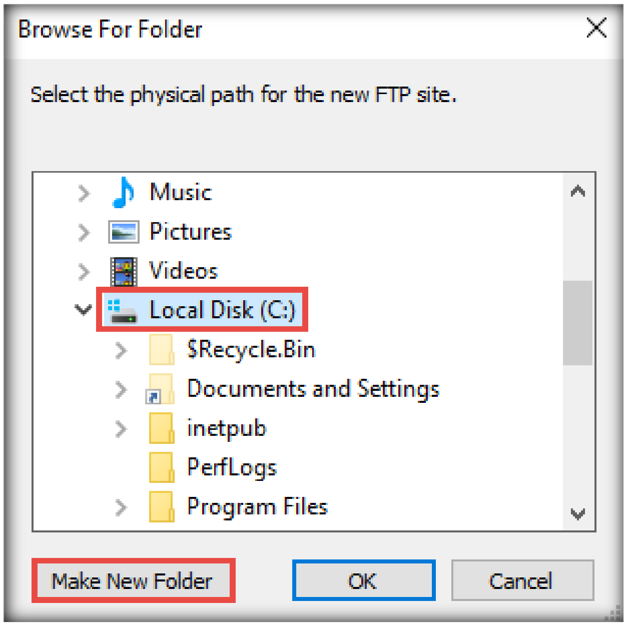
FTP site name: Localhost

Content Directory

Physical path:

...
Previous
Next
Finish
Cancel

12. The **Browse For Folder** wizard appears. Choose **C:** (or any drive) and click **Make New Folder**.

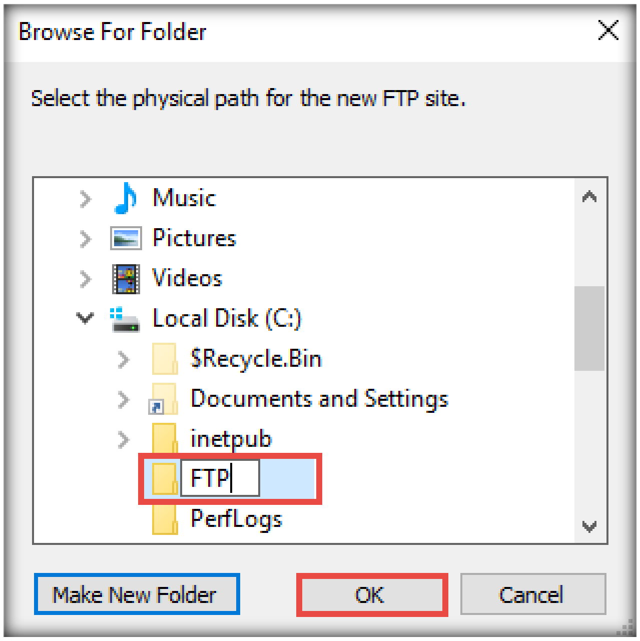


Browse For Folder

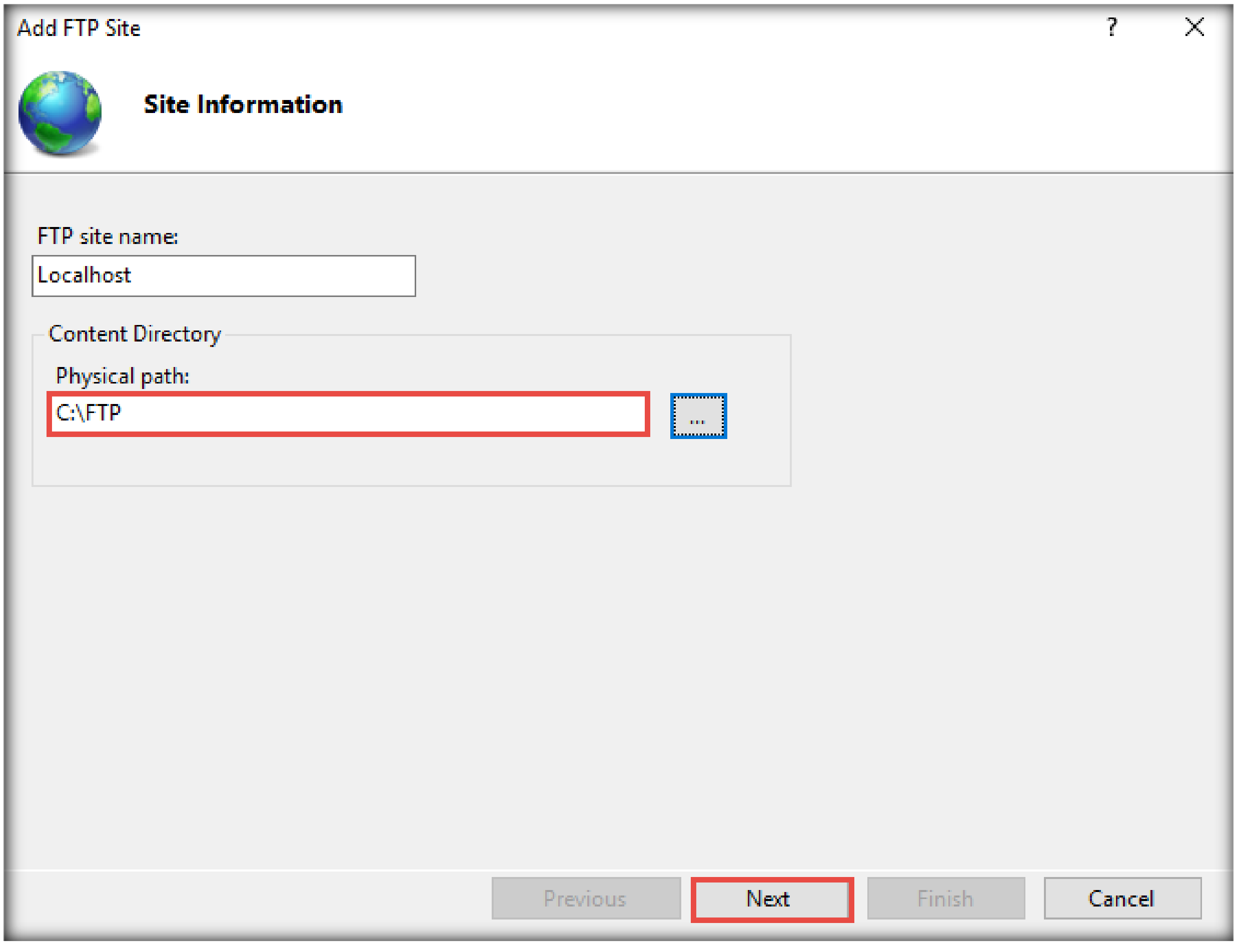
Select the physical path for the new FTP site.

Music
Pictures
Videos
Local Disk (C:)
$Recycle.Bin
Documents and Settings
inetpub
PerfLogs
Program Files
Make New Folder
OK
Cancel

13. A New Folder will be created. Rename it **FTP** and click **OK**.


Browse For Folder
Select the physical path for the new FTP site.
Music
Pictures
Videos
Local Disk (C:)
$Recycle.Bin
Documents and Settings
inetpub
FTP
PerfLogs
Make New Folder
OK
Cancel

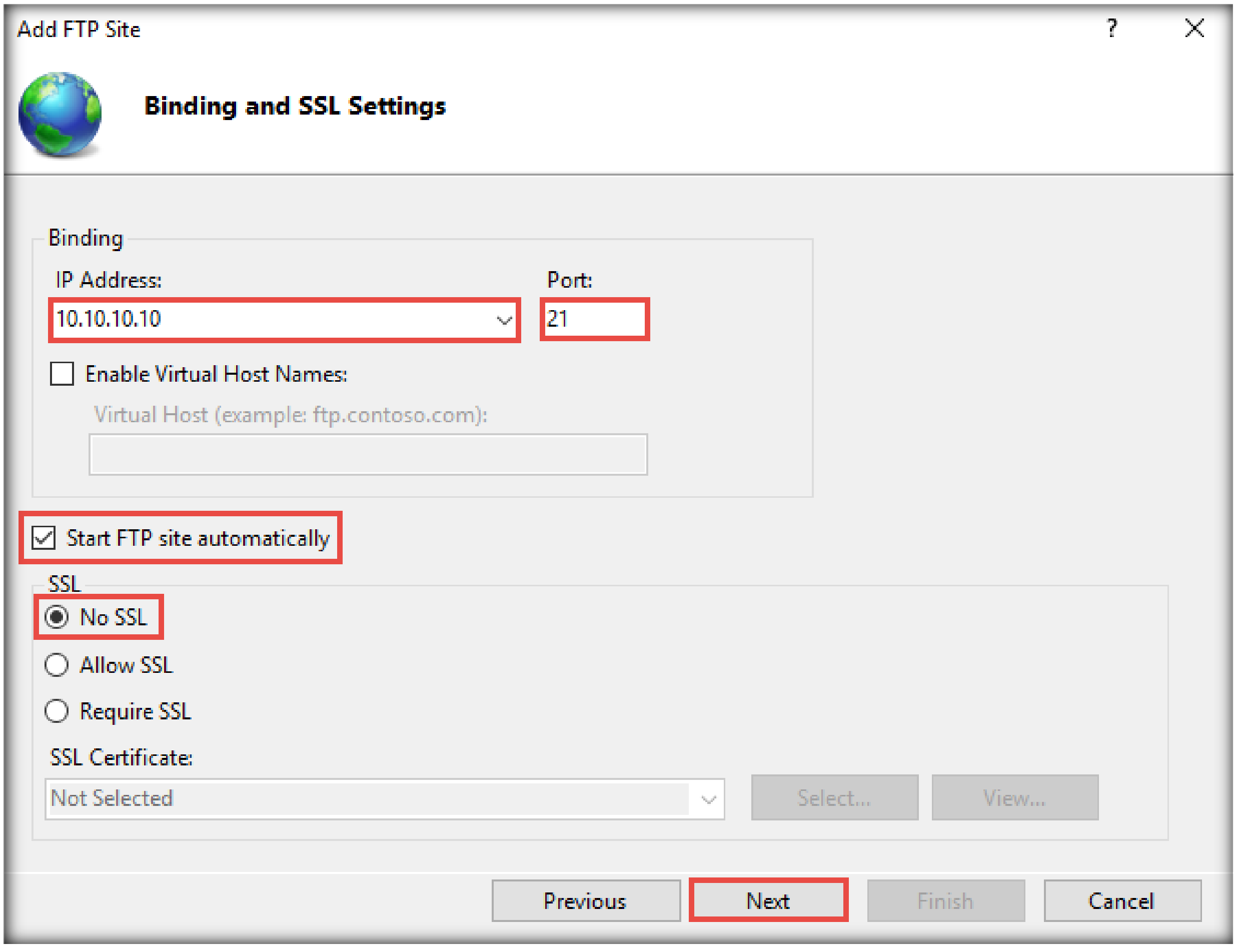
14. After the **Physical path** is provided, click the **Next** button.


Add FTP Site
?
Site Information
Content Directory
...
Previous
Next
Finish
Cancel

FTP site name:
Localhost

Physical path:
C:\FTP

15. In the **Binding and SSL Settings** section, enter the IP address of the **Windows 10** virtual machine under the **IP Address** field, leave the port number set to default as **21** under the **Port** field, ensure that the **Start FTP site automatically** checkbox is selected, and ensure that the **No SSL** radio button is selected under the **SSL** section. Then, click **Next**



Add FTP Site

Binding and SSL Settings

Binding

IP Address: 10.10.10.10

Port: 21

☐ Enable Virtual Host Names:

Virtual Host (example: ftp.contoso.com):

☑ Start FTP site automatically

SSL

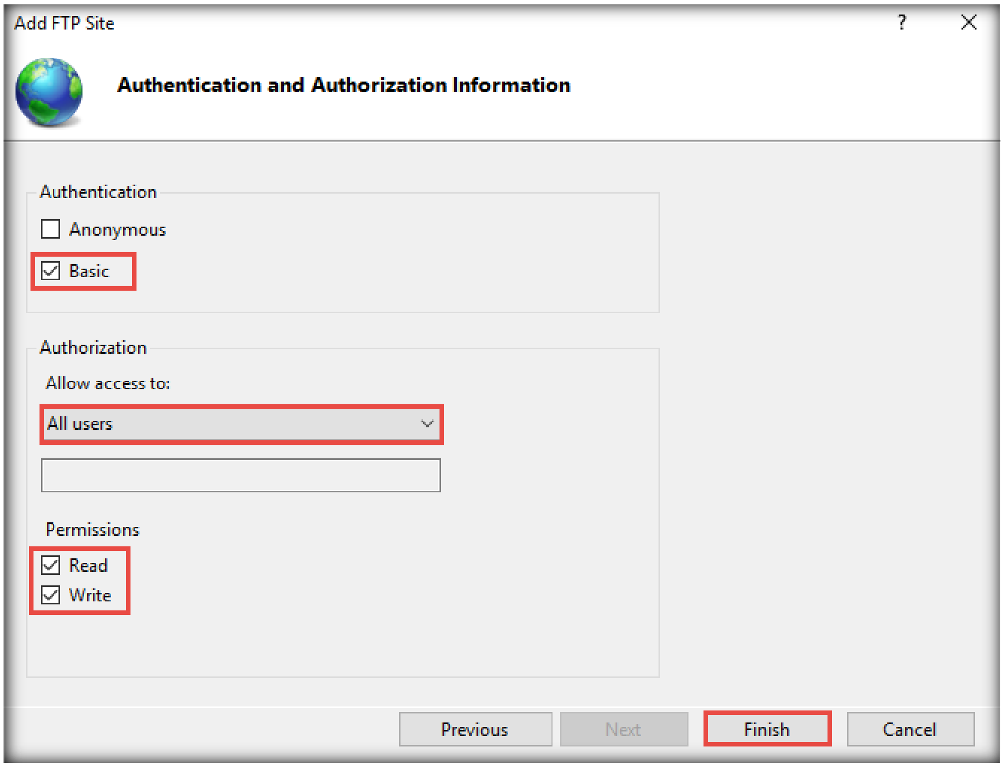
● No SSL

○ Allow SSL

○ Require SSL

SSL Certificate: Not Selected

16. For the **Authentication and Authorization Information** options, check **Basic** under **Authentication**, choose **All users** under **Authorization**, check the **Read** and **Write** options under **Permissions**, and click **Finish**.



Add FTP Site

Authentication and Authorization Information

Authentication

☐ Anonymous

☑ Basic

Authorization

Allow access to: All users

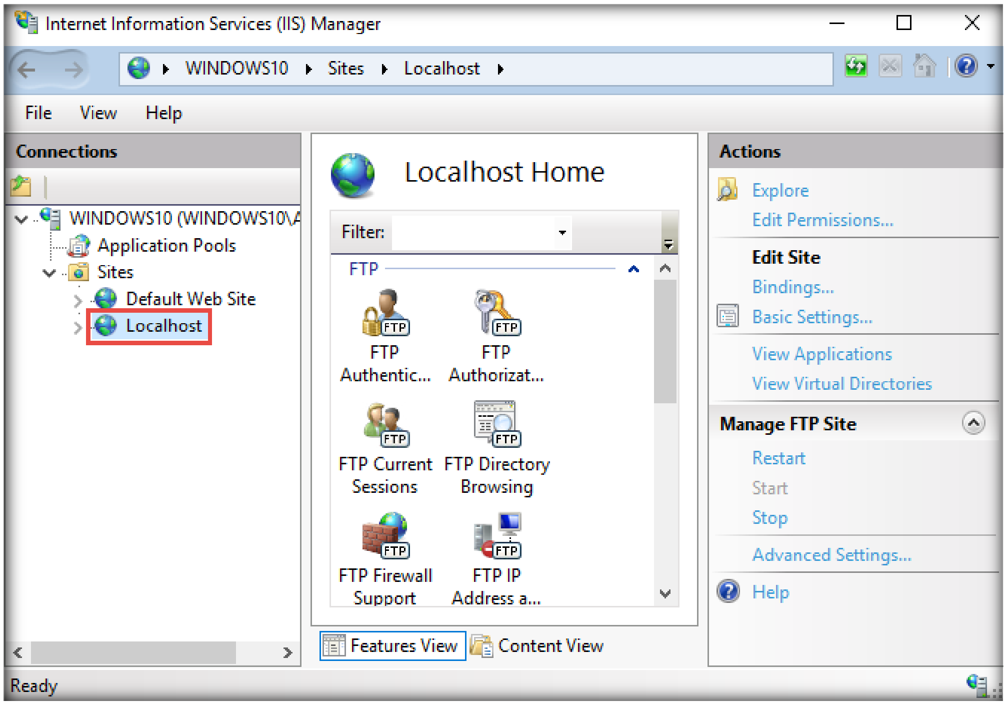
Permissions

☑ Read

☑ Write

?
Previous
Next
Finish
Cancel

17. The **Localhost** site will be created under the **Sites** folder, as shown in the screenshot.

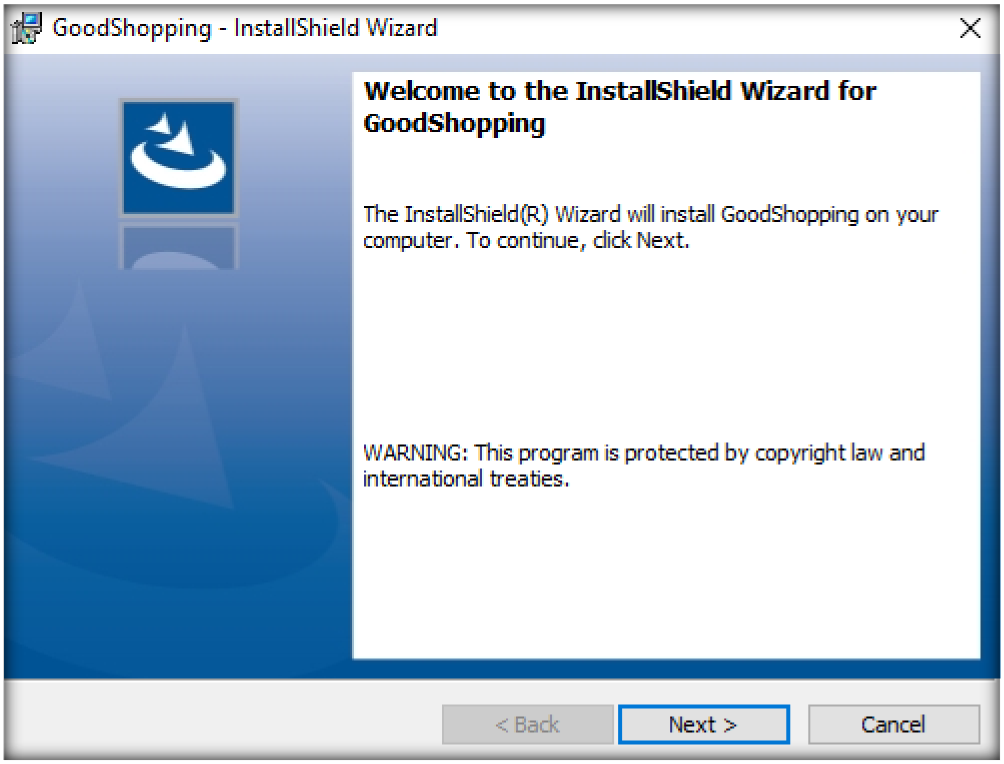


Internet Information Services (IIS) Manager
WINDOWS10 ▸ Sites ▸ Localhost ▸
File
View
Help
Connections
WINDOWS10 (WINDOWS10\A
Application Pools
Sites
Default Web Site
Localhost
Localhost Home
Filter:
FTP
FTP Authentic...
FTP Authorizat...
FTP Current Sessions
FTP Directory Browsing
FTP Firewall Support
FTP IP Address a...
Features View
Content View
Actions
Explore
Edit Permissions...
Edit Site
Bindings...
Basic Settings...
View Applications
View Virtual Directories
Manage FTP Site
Restart
Start
Stop
Advanced Settings...
Help
Ready

[Back to Configuration Task Outline]

# CT#36: Configure the GoodShopping Website Windows Server 2019 Virtual Machine

1. Turn on the **Windows 10** virtual machine.
2. Log in to the **Windows Server 2019** virtual machine with the credentials **Administrator** and **Pa$$w0rd**.
3. Navigate to **Z:\CEHv11 Lab Prerequisites\Websites**.
4. Open the **GoodShopping** folder. Double-click on **setup.exe** and follow the wizard-driven installation steps.

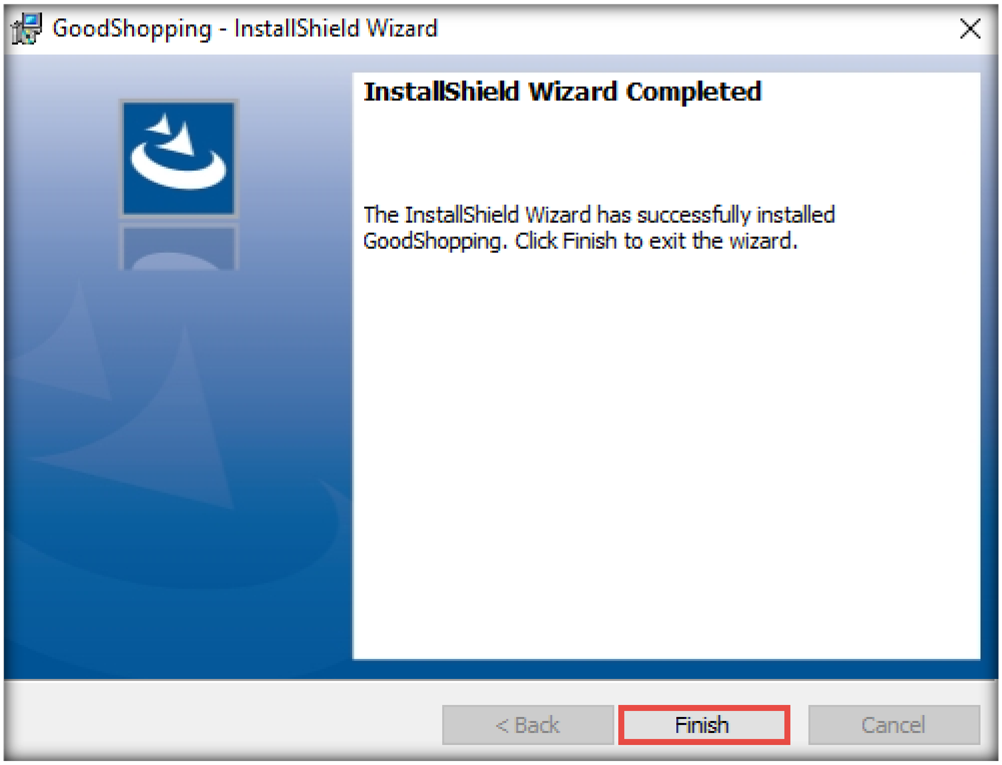


**Welcome to the InstallShield Wizard for GoodShopping**

The InstallShield(R) Wizard will install GoodShopping on your computer. To continue, click Next.

WARNING: This program is protected by copyright law and international treaties.

5. After completing the installation, click **Finish**.


GoodShopping - InstallShield Wizard
< Back
Finish
Cancel

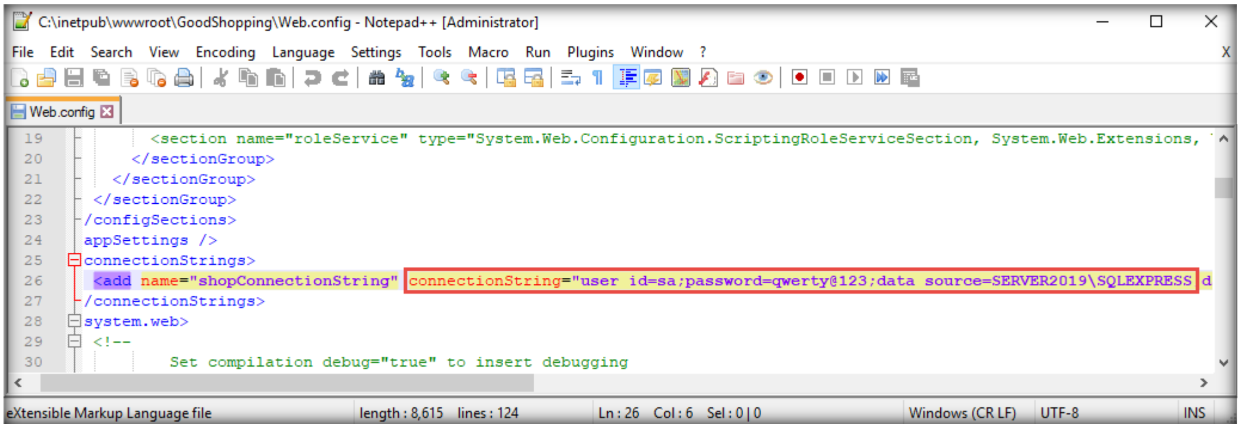
**InstallShield Wizard Completed**

The InstallShield Wizard has successfully installed GoodShopping. Click Finish to exit the wizard.

6. Open The **GoodShopping** folder from **C:\inetpub\wwwroot\GoodShopping**, and then open the **Web.config** file in **notepad++** or in **notepad**.

7. Scroll down to the **connectionString** tag (**Line No. 26**) and enter your machine's name **data source=[Provide Your Host Machine Name]\SQLEXPRESS**. Provide a user id after **user id=sa**, and a password after **password=qwerty@123**.

   **Note**: Here, the host machine name is **SERVER2019**. The host machine name of the **Windows Server 2019** machine might vary in your lab environment.

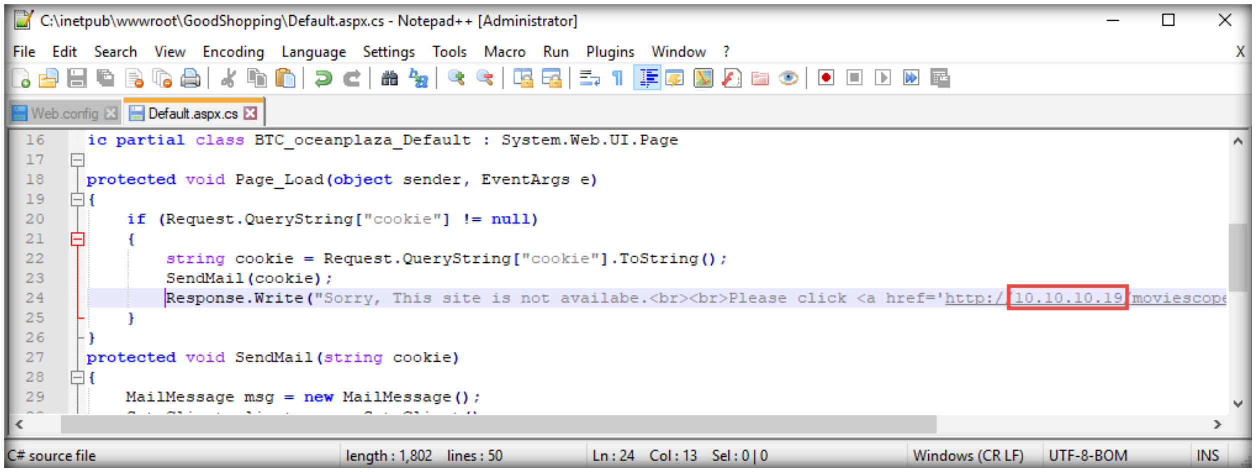

C:\inetpub\wwwroot\GoodShopping\Web.config - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
Web.config
eXtensible Markup Language file
length : 8,615 lines : 124
Ln : 26 Col : 6 Sel : 0 | 0
Windows (CR LF)
UTF-8
INS

```
19          <section name="roleService" type="System.Web.Configuration.ScriptingRoleServiceSection, System.Web.Extensions, 
20        </sectionGroup>
21      </sectionGroup>
22    </sectionGroup>
23  /configSections>
24  appSettings />
25  connectionStrings>
26    <add name="shopConnectionString" connectionString="user id=sa;password=qwerty@123;data source=SERVER2019\SQLEXPRESS d
27  /connectionStrings>
28  system.web>
29    <!--
30          Set compilation debug="true" to insert debugging
```

8. **Save** the file and **close** it.

9. Now, open the **Default.aspx.cs** file in **notepad++** or in **notepad** from the location **C:\inetpub\wwwroot\GoodShopping**

10. Scroll down to **line no. 24** and replace localhost with the IP address of the **Windows Server 2019** machine (here, **10.10.10.19**). Use the IP address of the machine where you are hosting the website.



C:\inetpub\wwwroot\GoodShopping\Default.aspx.cs - Notepad++ [Administrator]

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
Web.config
Default.aspx.cs

```
16  ic partial class BTC_oceanplaza_Default : System.Web.UI.Page
17
18  protected void Page_Load(object sender, EventArgs e)
19  {
20      if (Request.QueryString["cookie"] != null)
21      {
22          string cookie = Request.QueryString["cookie"].ToString();
23          SendMail(cookie);
24          Response.Write("Sorry, This site is not availabe.<br><br>Please click <a href='http://10.10.10.19/moviescope
25      }
26  }
27  protected void SendMail(string cookie)
28  {
29      MailMessage msg = new MailMessage();
```

C# source file    length : 1,802    lines : 50    Ln : 24    Col : 13    Sel : 0 | 0    Windows (CR LF)    UTF-8-BOM    INS

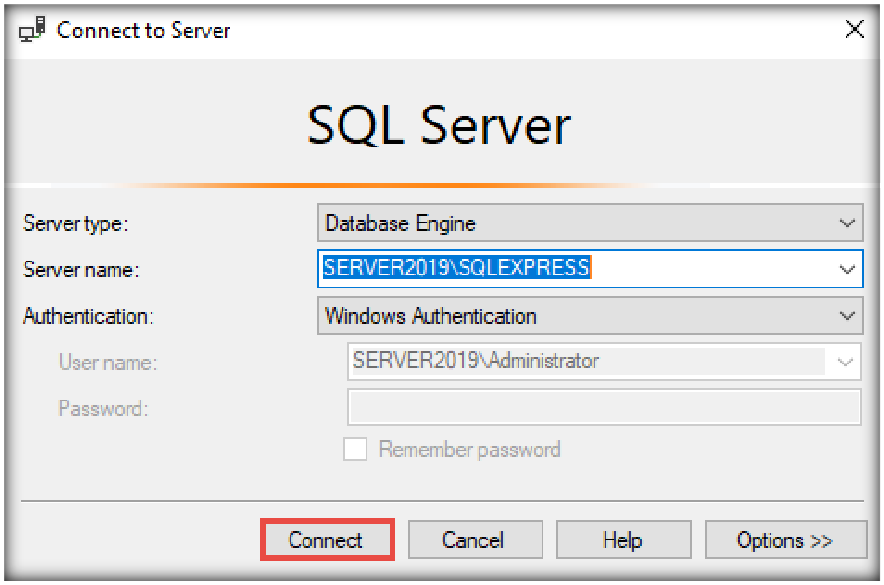
**Note**: The IP address of Windows Server 2019 machine might vary in your lab environment.

11. **Save** and **close** the file.

12. Now, launch **Microsoft SQL Server Management Studio**.

   - Click the **Type here to search** icon ( ) from the lower section of **Desktop** and type **microsoft**. From the results, select **Microsoft SQL Server Management Studio 18**.

   - The **Microsoft SQL Server Management Studio** window appears along with the **Connect to Server** pop-up. In the **Connect to Server** pop-up, leave the settings to default and click the **Connect** button.



Connect to Server

Server type: Database Engine

Server name: SERVER2019\SQLEXPRESS

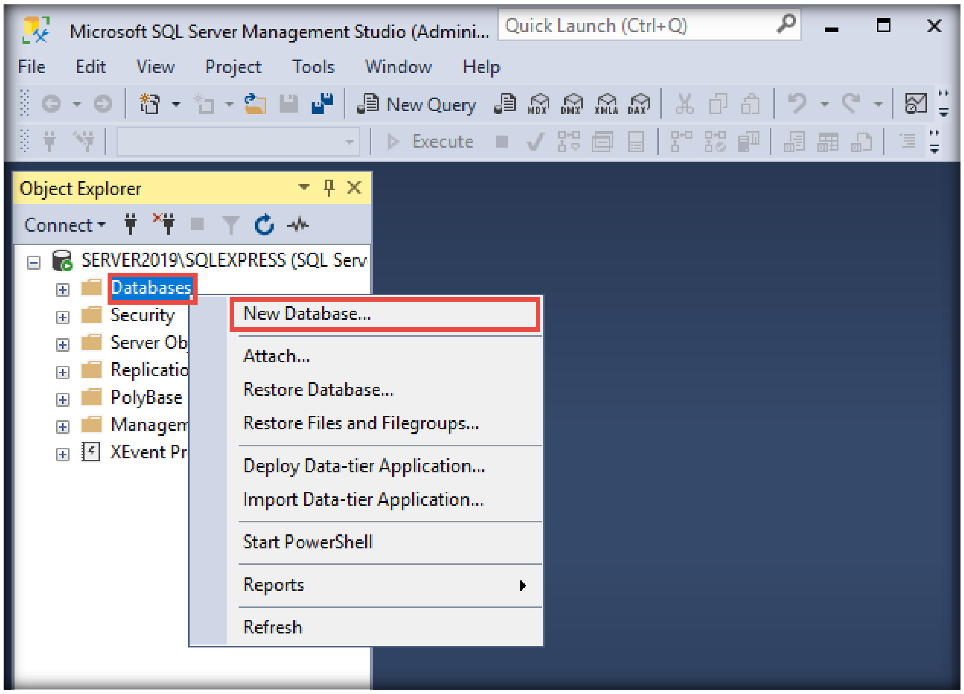
Authentication: Windows Authentication

User name: SERVER2019\Administrator

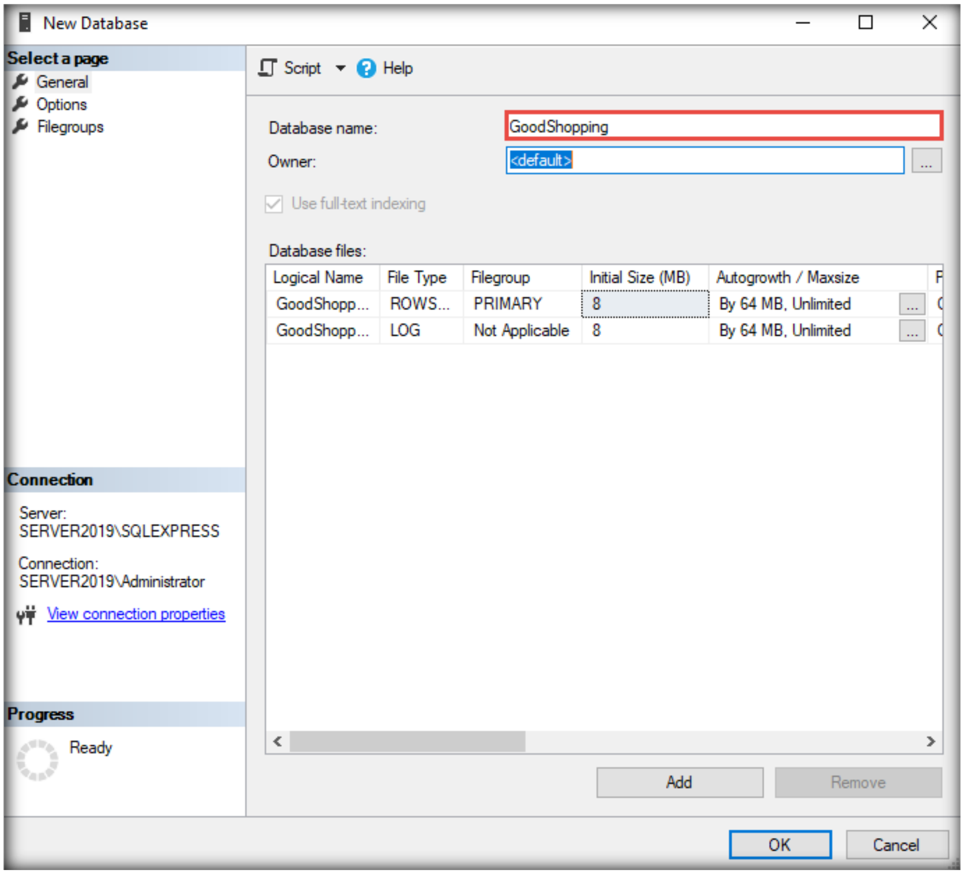
Password:

☐ Remember password

13. In the **Microsoft SQL Server Management Studio** window, right-click on **Databases** and select **New Database...**


Microsoft SQL Server Management Studio (Admini...
Quick Launch (Ctrl+Q)
File Edit View Project Tools Window Help
New Query
Execute
Object Explorer
Connect
SERVER2019\SQLEXPRESS (SQL Serv
Databases
Security
Server Ob
Replicatio
PolyBase
Managem
XEvent Pr
New Database...
Attach...
Restore Database...
Restore Files and Filegroups...
Deploy Data-tier Application...
Import Data-tier Application...
Start PowerShell
Reports
Refresh

14. The **New Database** window appears; specify **Database name** as **GoodShopping**.


New Database
Select a page
General
Options
Filegroups
Script
Help
Use full-text indexing
Connection
View connection properties
Progress
Ready
Add
Remove
OK
Cancel

Database name: GoodShopping

Owner: <default>

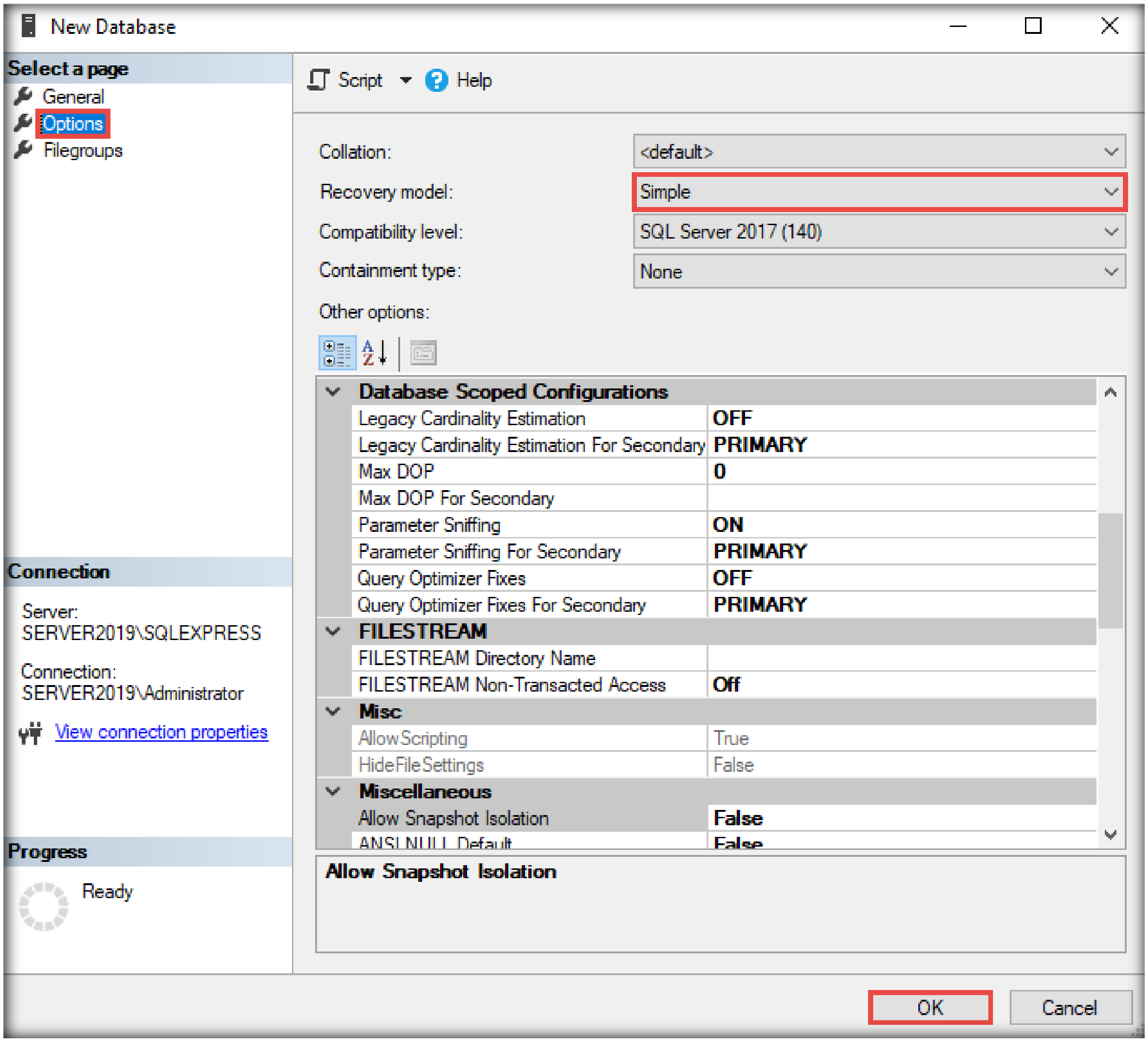
Server: SERVER2019\SQLEXPRESS

Connection: SERVER2019\Administrator

Database files:

| Logical Name | File Type | Filegroup | Initial Size (MB) | Autogrowth / Maxsize |
|---|---|---|---|---|
| GoodShopp... | ROWS... | PRIMARY | 8 | By 64 MB, Unlimited |
| GoodShopp... | LOG | Not Applicable | 8 | By 64 MB, Unlimited |

15. Select **Options** from the left pane and ensure that the **Simple** option is selected in the **Recovery model** field, and then click **OK**.


New Database
Select a page
General
Options
Filegroups
Script
Help
Connection
View connection properties
Progress
Ready
Other options:
OK
Cancel

Collation: <default>
Recovery model: Simple
Compatibility level: SQL Server 2017 (140)
Containment type: None

Server:
SERVER2019\SQLEXPRESS

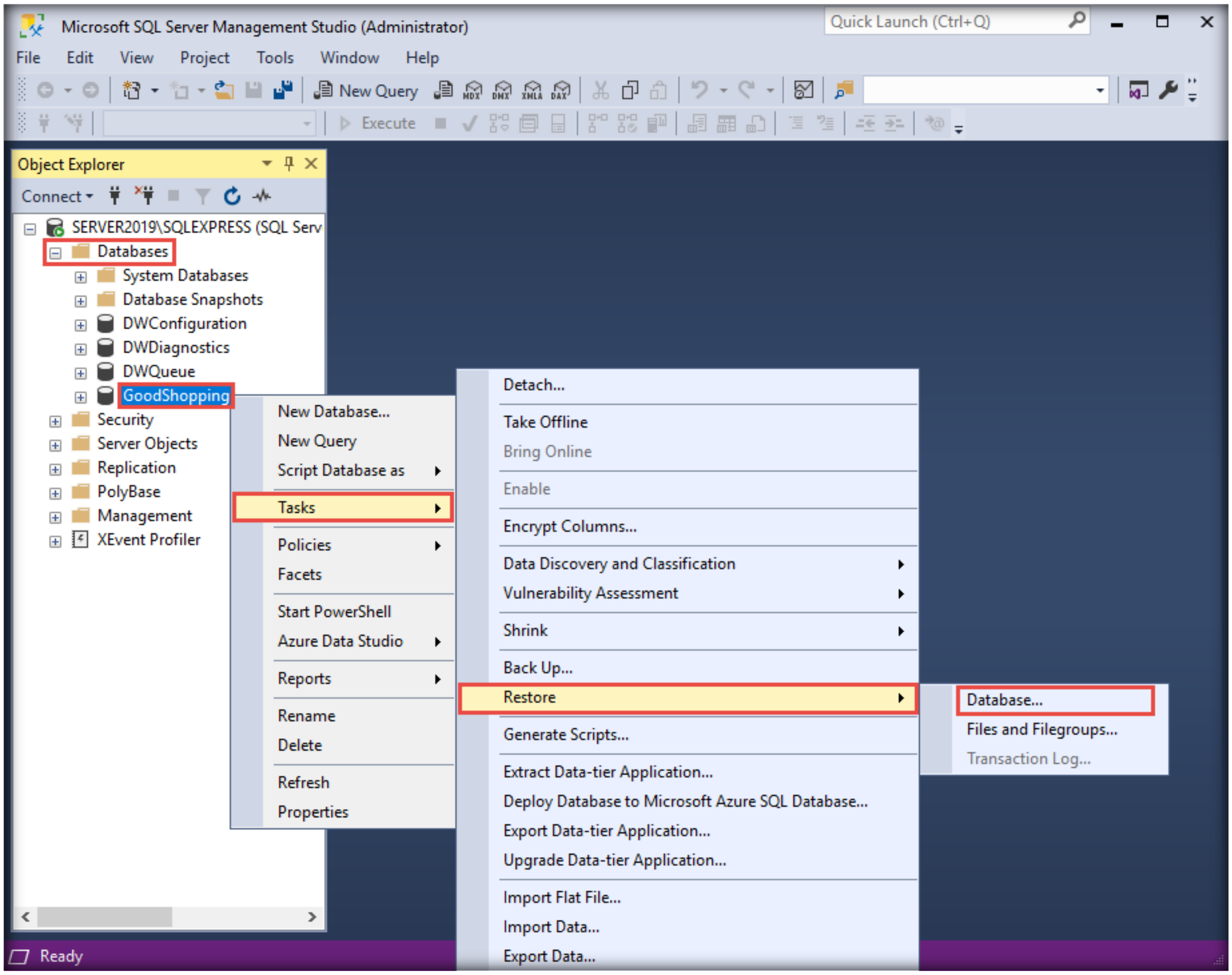
Connection:
SERVER2019\Administrator

| Database Scoped Configurations | |
|---|---|
| Legacy Cardinality Estimation | OFF |
| Legacy Cardinality Estimation For Secondary | PRIMARY |
| Max DOP | 0 |
| Max DOP For Secondary | |
| Parameter Sniffing | ON |
| Parameter Sniffing For Secondary | PRIMARY |
| Query Optimizer Fixes | OFF |
| Query Optimizer Fixes For Secondary | PRIMARY |
| **FILESTREAM** | |
| FILESTREAM Directory Name | |
| FILESTREAM Non-Transacted Access | Off |
| **Misc** | |
| AllowScripting | True |
| HideFileSettings | False |
| **Miscellaneous** | |
| Allow Snapshot Isolation | False |
| ANSI NULL Default | False |

**Allow Snapshot Isolation**

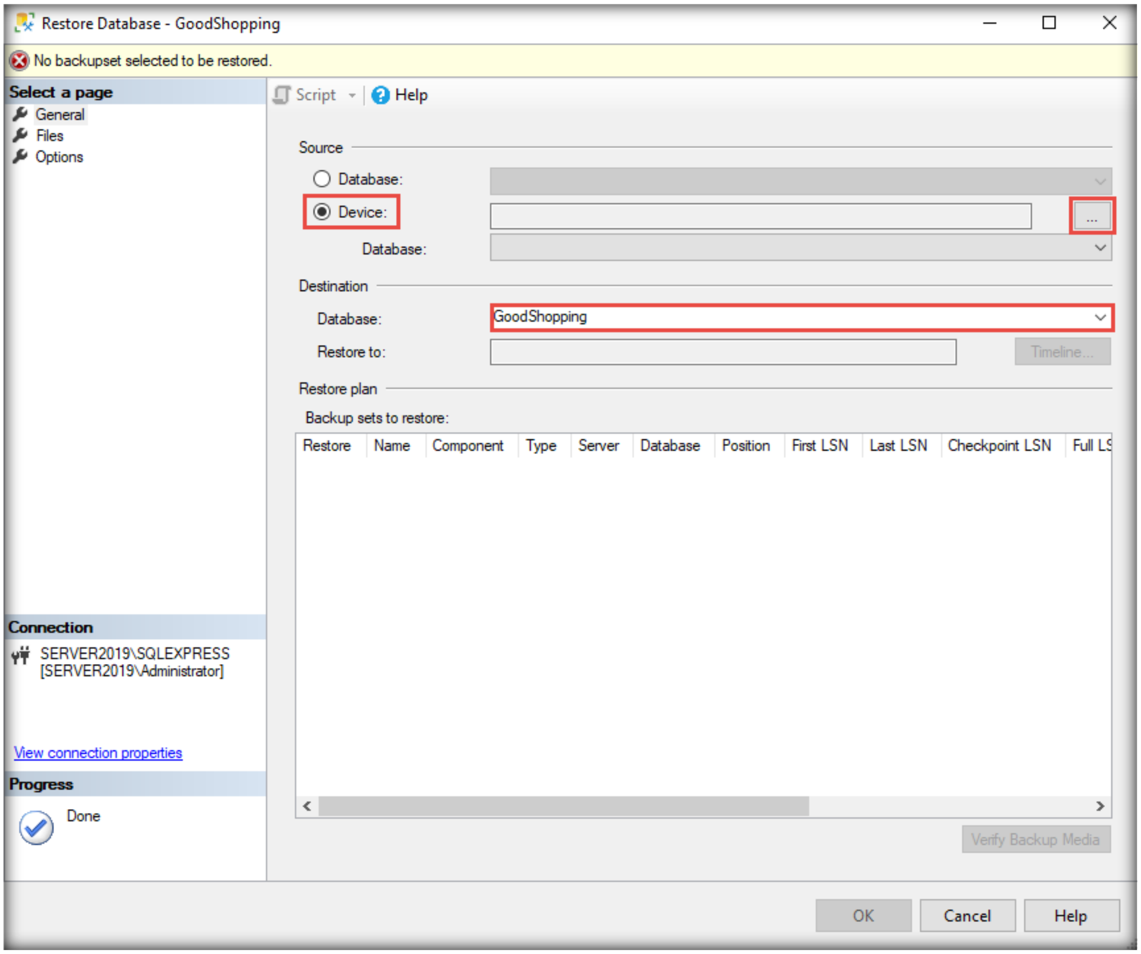
16. Now, expand the **Databases** node. Observe that the **GoodShopping** database folder appears under the **Object Explorer** section, which implies that the GoodShopping database has **successfully** been created.

17. Right-click on the **GoodShopping** database and go to **Tasks** → **Restore** → **Database...**


Microsoft SQL Server Management Studio (Administrator)
Quick Launch (Ctrl+Q)
File Edit View Project Tools Window Help
New Query
Execute
Object Explorer
Connect
SERVER2019\SQLEXPRESS (SQL Serv
Databases
System Databases
Database Snapshots
DWConfiguration
DWDiagnostics
DWQueue
GoodShopping
Security
Server Objects
Replication
PolyBase
Management
XEvent Profiler
New Database...
New Query
Script Database as
Tasks
Policies
Facets
Start PowerShell
Azure Data Studio
Reports
Rename
Delete
Refresh
Properties
Detach...
Take Offline
Bring Online
Enable
Encrypt Columns...
Data Discovery and Classification
Vulnerability Assessment
Shrink
Back Up...
Restore
Generate Scripts...
Extract Data-tier Application...
Deploy Database to Microsoft Azure SQL Database...
Export Data-tier Application...
Upgrade Data-tier Application...
Import Flat File...
Import Data...
Export Data...
Database...
Files and Filegroups...
Transaction Log...
Ready

18. The **Restore Database – GoodShopping** window appears, displaying the database name (**GoodShopping**) in the **Database** field under the **Destination** section.

19. Select the **Device** radio button under the **Source** section and click the ... button located parallel to the **Device** field.


Restore Database - GoodShopping
Select a page
General
Files
Options
Script
Help
Source
Database:
Device:
...
Database:
Destination
Restore to:
Timeline...
Restore plan
Backup sets to restore:
Restore
Name
Component
Type
Server
Database
Position
First LSN
Last LSN
Checkpoint LSN
Full LS
Connection
View connection properties
Progress
Verify Backup Media
OK
Cancel
Help

No backupset selected to be restored.

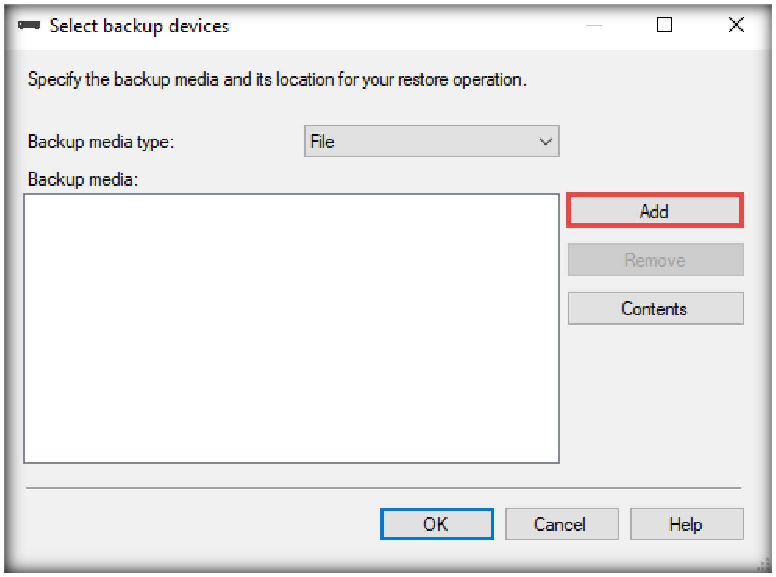
● Device:

Destination Database: GoodShopping

SERVER2019\SQLEXPRESS
[SERVER2019\Administrator]

Progress: Done

20. The **Select backup devices** dialog box appears; click the **Add** button.

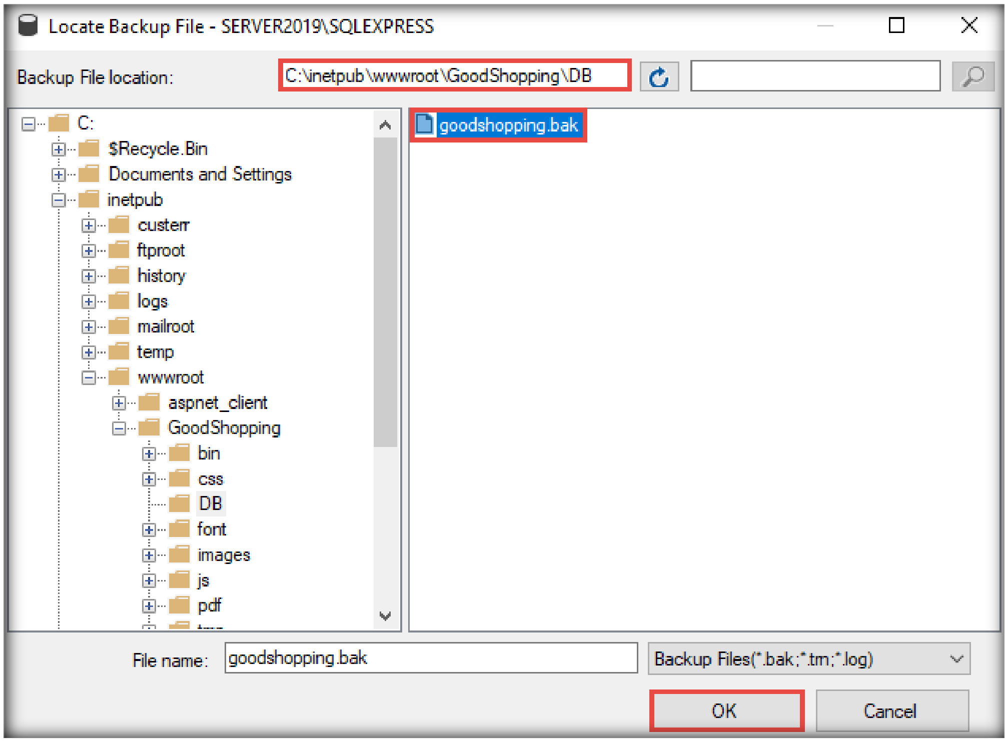

Select backup devices
Backup media:
Add
Remove
Contents
OK
Cancel
Help

Specify the backup media and its location for your restore operation.

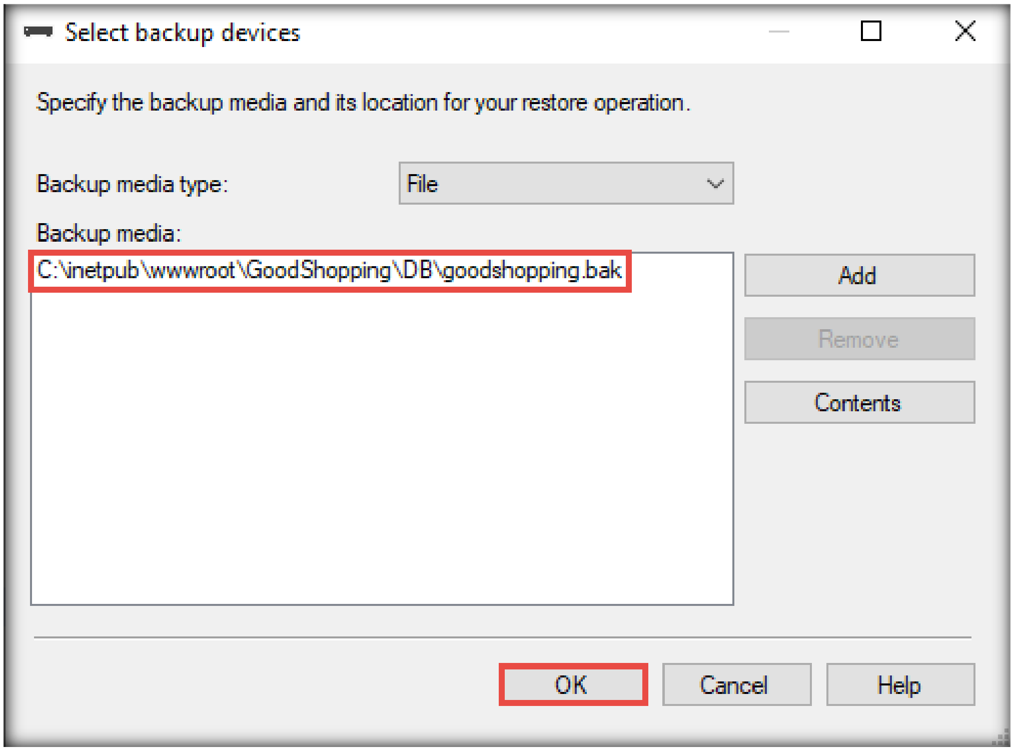
Backup media type: File

21. In the **Locate Backup File** window, navigate to the backup file (**goodshopping.bak**) located in **C:\inetpub\wwwroot\GoodShopping\DB**.

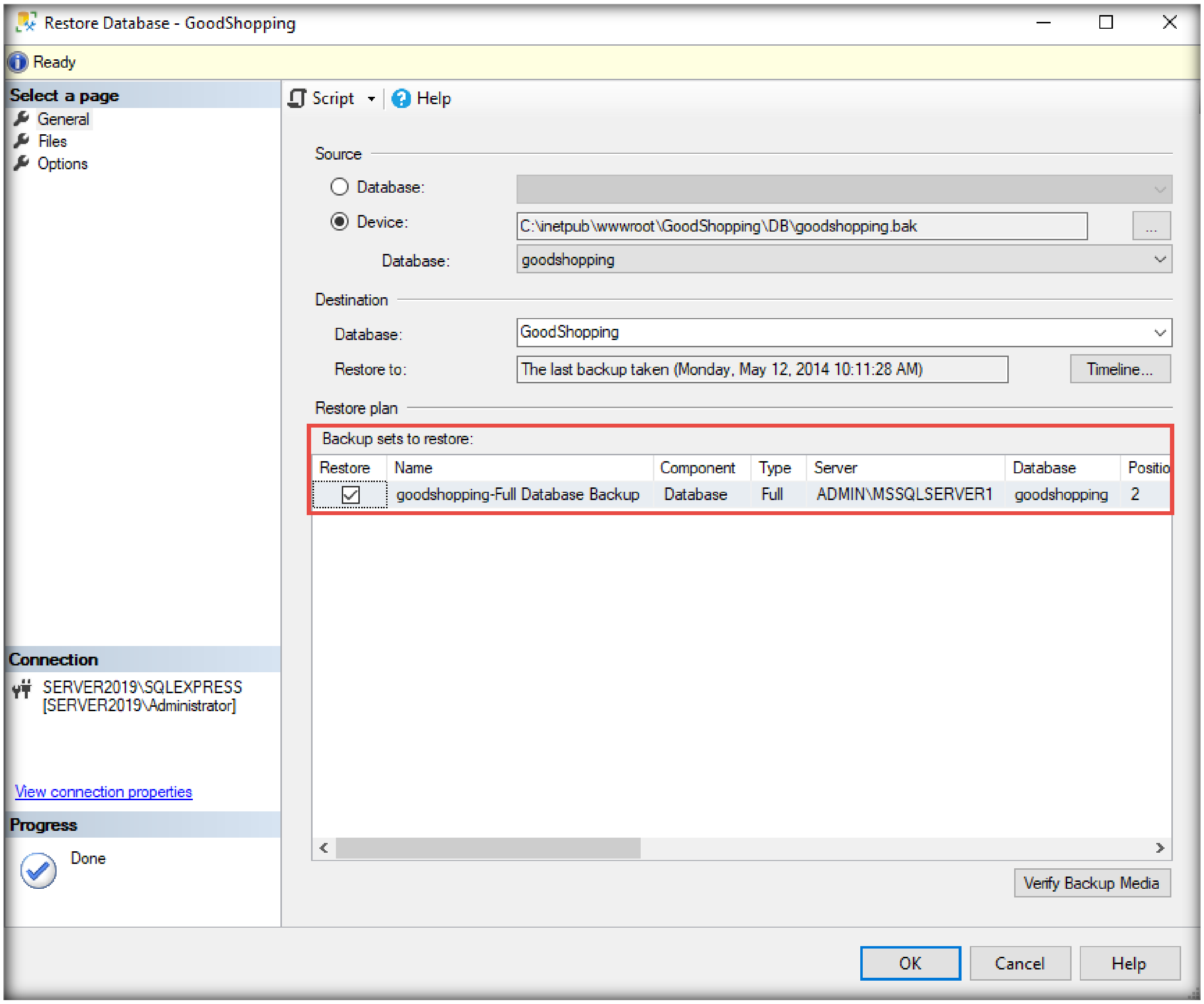
22. Select the backup file, and then click **OK**.


Locate Backup File - SERVER2019\SQLEXPRESS
Backup File location:
C:\inetpub\wwwroot\GoodShopping\DB
C:
$Recycle.Bin
Documents and Settings
inetpub
custerr
ftproot
history
logs
mailroot
temp
wwwroot
aspnet_client
GoodShopping
bin
css
DB
font
images
js
pdf
goodshopping.bak
File name:
goodshopping.bak
Backup Files(*.bak;*.tm;*.log)
OK
Cancel

23. The **Select backup devices** window appears; under the **Backup media** section, the location of the **goodshopping.bak** website is listed; click **OK**.


Select backup devices
Specify the backup media and its location for your restore operation.
Backup media type:
File
Backup media:
C:\inetpub\wwwroot\GoodShopping\DB\goodshopping.bak
Add
Remove
Contents
OK
Cancel
Help

24. Observe that the backup file has been successfully added. Ensure that the backup file is checked.



Restore Database - GoodShopping
Ready
Select a page
General
Files
Options
Script
Help
Timeline...
View connection properties
Verify Backup Media
OK
Cancel
Help

Source

○ Database:

● Device: C:\inetpub\wwwroot\GoodShopping\DB\goodshopping.bak

Database: goodshopping

Destination

Database: GoodShopping

Restore to: The last backup taken (Monday, May 12, 2014 10:11:28 AM)

Restore plan

Backup sets to restore:

| Restore | Name | Component | Type | Server | Database | Positio |
|---|---|---|---|---|---|---|
| ☑ | goodshopping-Full Database Backup | Database | Full | ADMIN\MSSQLSERVER1 | goodshopping | 2 |

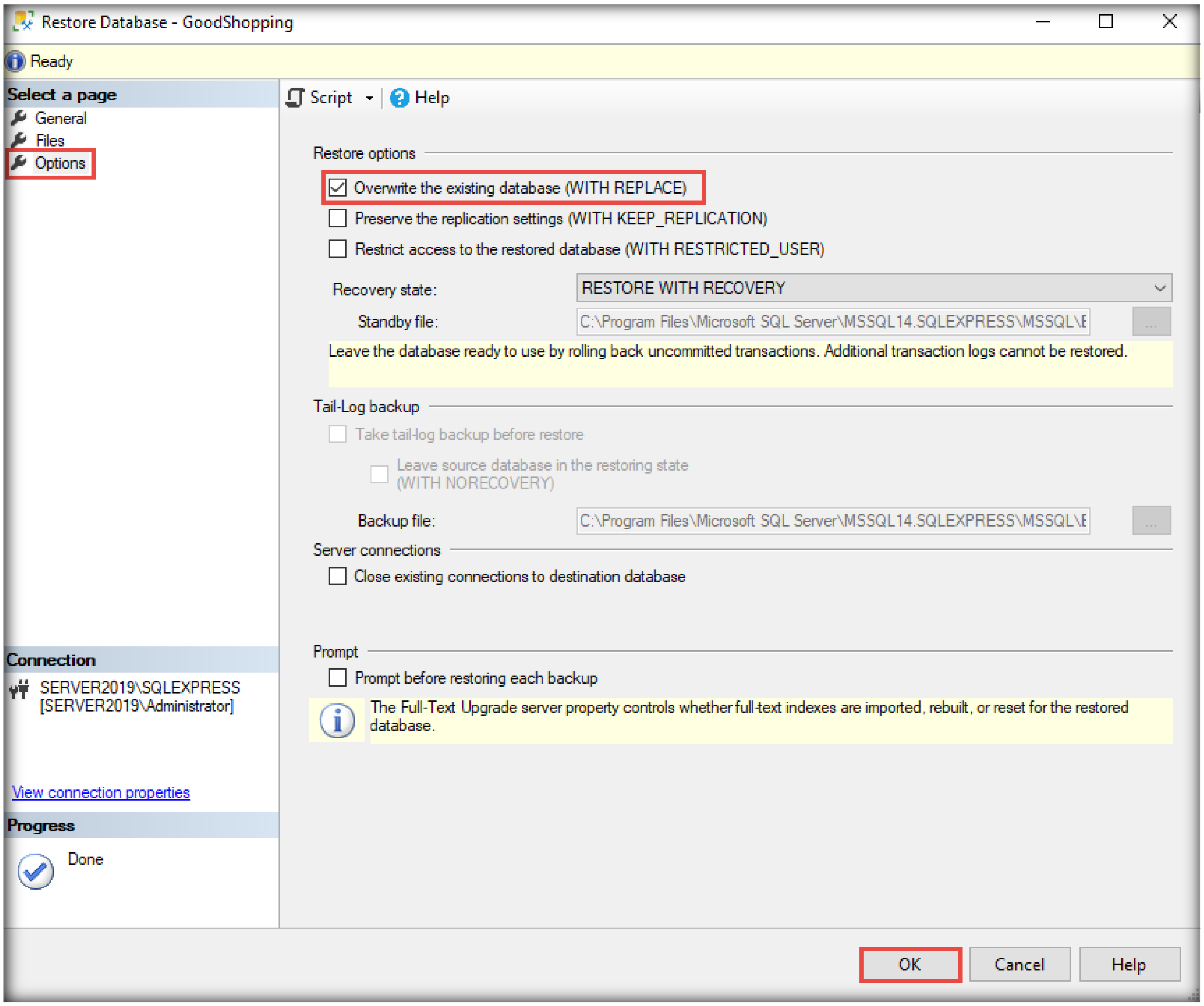
Connection

SERVER2019\SQLEXPRESS
[SERVER2019\Administrator]

Progress

Done

25. Click **Options** in the left pane and check **Overwrite the existing database (WITH REPLACE)** under the **Restore options** section; click **OK**.


Restore Database - GoodShopping
Ready
Select a page
General
Files
Options
Script
Help
Connection
View connection properties
Progress
Done
OK
Cancel
Help

Restore options

☑ Overwrite the existing database (WITH REPLACE)

☐ Preserve the replication settings (WITH KEEP_REPLICATION)

☐ Restrict access to the restored database (WITH RESTRICTED_USER)

Recovery state: RESTORE WITH RECOVERY

Standby file: C:\Program Files\Microsoft SQL Server\MSSQL14.SQLEXPRESS\MSSQL\E

Leave the database ready to use by rolling back uncommitted transactions. Additional transaction logs cannot be restored.

Tail-Log backup

☐ Take tail-log backup before restore

☐ Leave source database in the restoring state (WITH NORECOVERY)

Backup file: C:\Program Files\Microsoft SQL Server\MSSQL14.SQLEXPRESS\MSSQL\E

Server connections

☐ Close existing connections to destination database

Prompt

☐ Prompt before restoring each backup

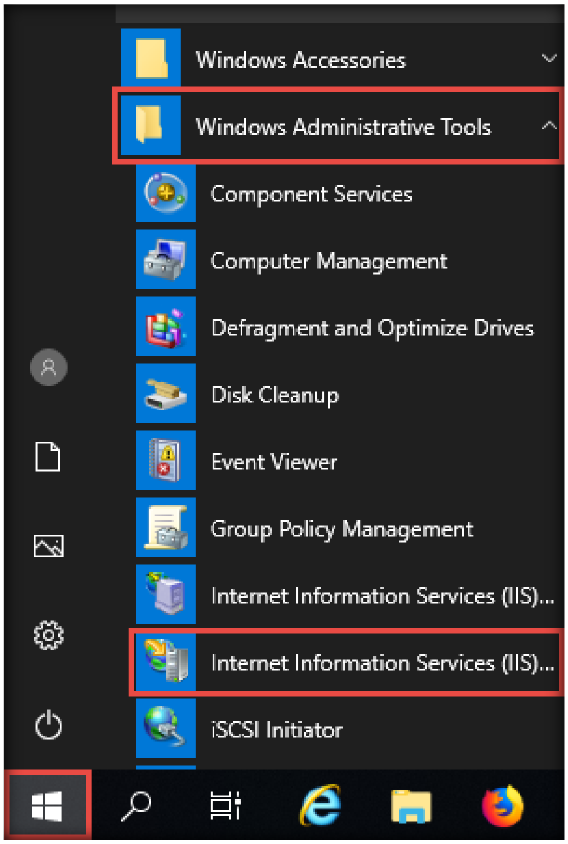
The Full-Text Upgrade server property controls whether full-text indexes are imported, rebuilt, or reset for the restored database.

SERVER2019\SQLEXPRESS [SERVER2019\Administrator]

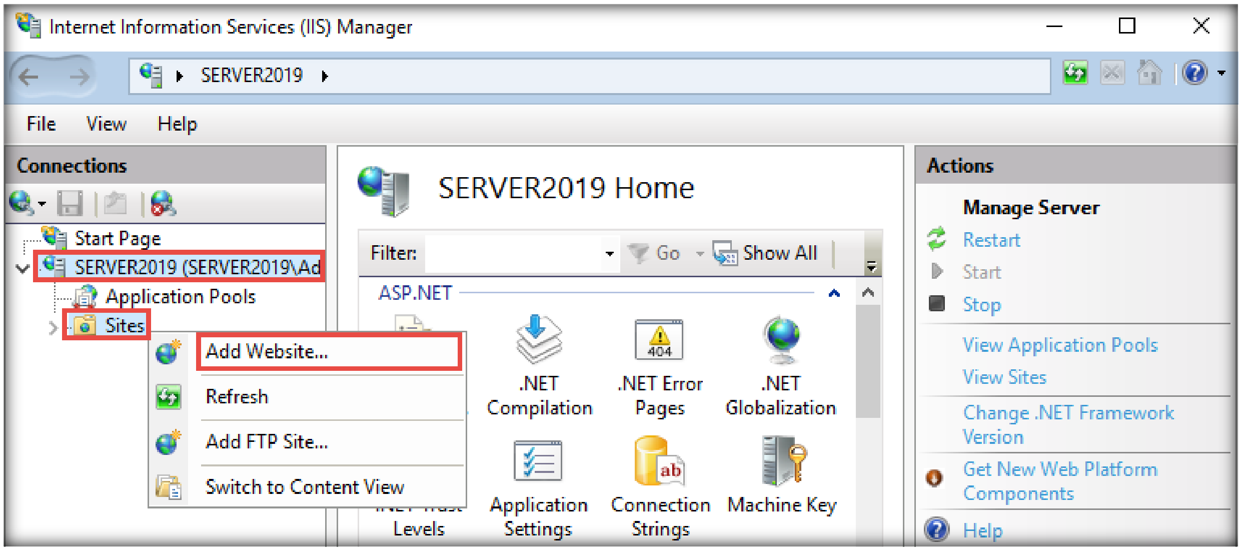
26. The **Microsoft SQL Server Management Studio** pop-up appears, stating that the database has been successfully created; click **OK**.

27. You have successfully **restored** the **database** of GoodShopping on your machine; the GoodShopping website is now hosted by your local machine.

28. Now, click the **Start** menu button and click **Windows Administrative Tools** → **Internet Information Services (IIS) Manager**.

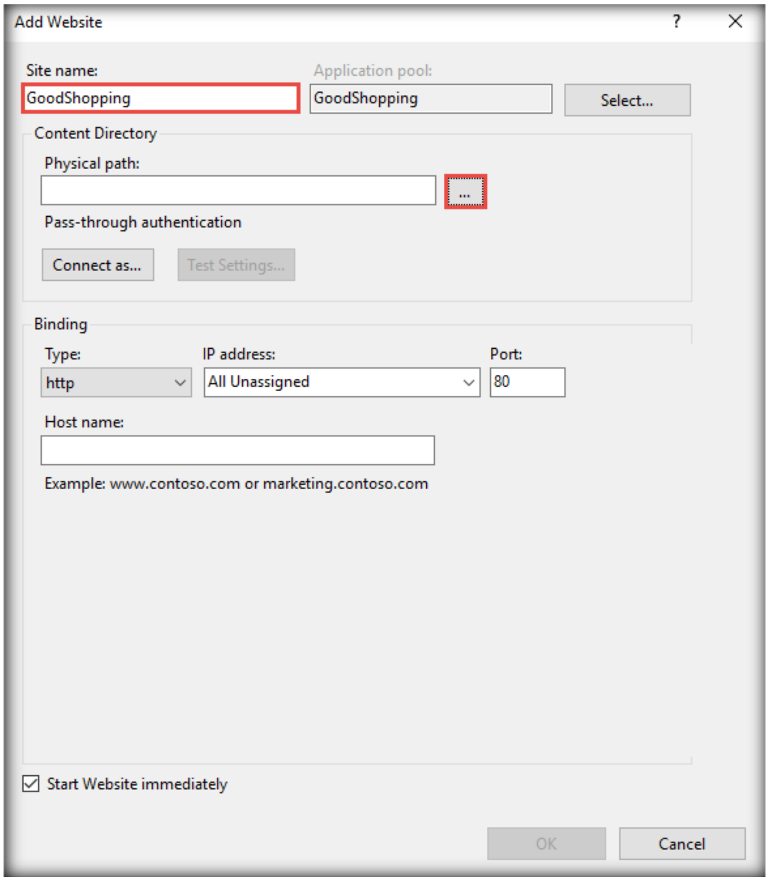

Windows Accessories
Windows Administrative Tools
Component Services
Computer Management
Defragment and Optimize Drives
Disk Cleanup
Event Viewer
Group Policy Management
Internet Information Services (IIS)...
Internet Information Services (IIS)...
iSCSI Initiator

29. The **Internet Information Services (IIS) Manager** main window appears. Now, in the left pane of the window, expand **Machine Name**, right-click on **Sites**, and click **Add Website...** from the context menu.


Internet Information Services (IIS) Manager
SERVER2019
File
View
Help
Connections
Start Page
SERVER2019 (SERVER2019\Ad
Application Pools
Sites
Add Website...
Refresh
Add FTP Site...
Switch to Content View
SERVER2019 Home
Filter:
Go
Show All
ASP.NET
.NET Compilation
.NET Error Pages
.NET Globalization
Levels
Application Settings
Connection Strings
Machine Key
Actions
Manage Server
Restart
Start
Stop
View Application Pools
View Sites
Change .NET Framework Version
Get New Web Platform Components
Help

30. The **Add Website** wizard appears. Type the site name in the **Site name:** field and click on the **Browse** button near the **Physical path:** section.

    **Note**: Here, we are installing the GoodShopping site, so we have provided **GoodShopping** in the **Site name:** field.


Add Website
?
Content Directory
Physical path:
...
Pass-through authentication
Connect as...
Test Settings...
Binding
Host name:
Example: www.contoso.com or marketing.contoso.com
Select...
OK
Cancel

Site name: GoodShopping

Application pool: GoodShopping

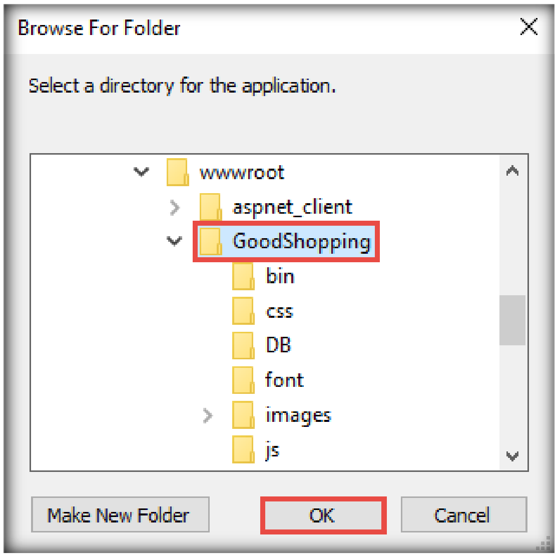
Type: http

IP address: All Unassigned

Port: 80

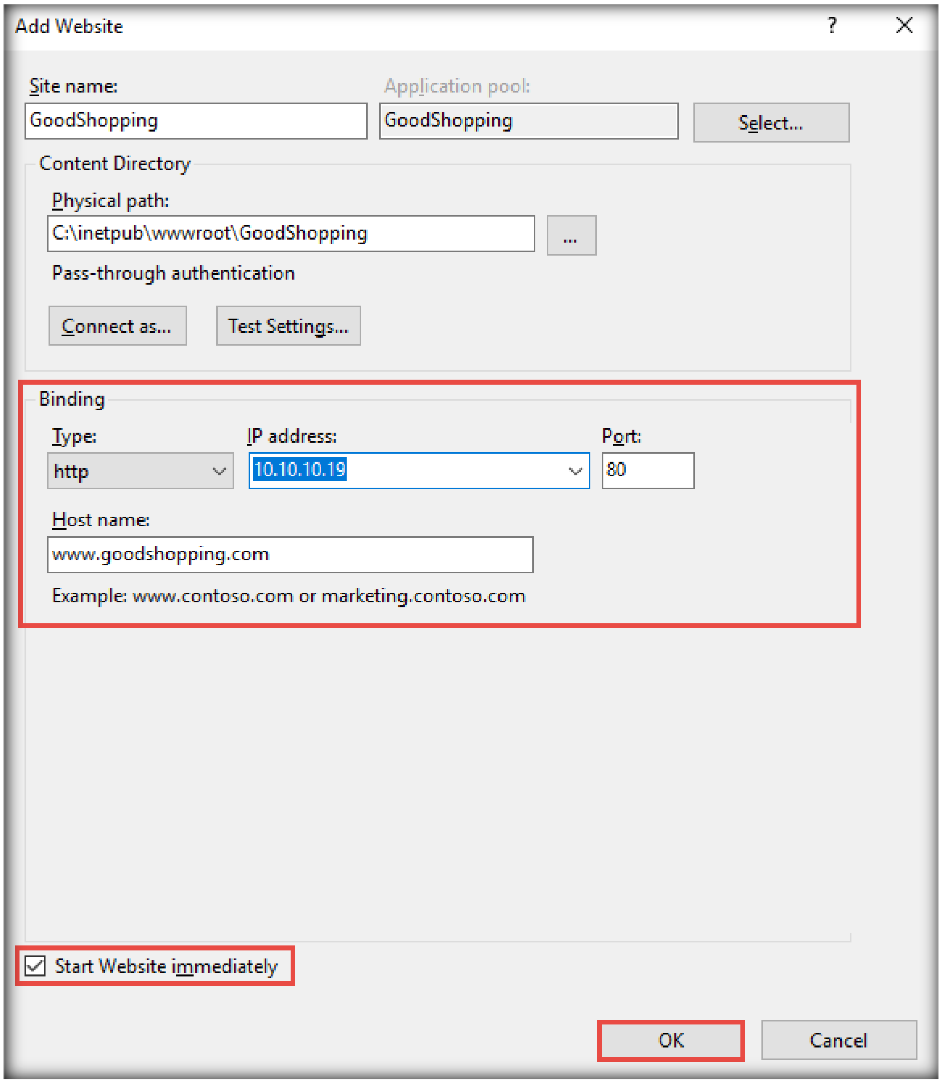
☑ Start Website immediately

31. The **Browse for Folder** pop-up appears. Navigate to **C:\inetpub\wwwroot**, choose the **GoodShopping** folder, and click **OK**.


Browse For Folder
wwwroot
aspnet_client
GoodShopping
bin
css
DB
font
images
js
Make New Folder
OK
Cancel

Select a directory for the application.

32. Now, in the **Binding** section of the **Add Website** window, choose **http** in the **Type:** field. Choose the host machine IP address (here, **10.10.10.19**) from the **IP address:** field and type **80** in the **Port:** field.
33. Type **www.goodshopping.com** in the **Host name:** field. Make sure that **Start Website immediately** is checked, and click **OK**.



Site name: GoodShopping

Application pool: GoodShopping

Content Directory

Physical path: C:\inetpub\wwwroot\GoodShopping

Pass-through authentication

Binding

Type: http

IP address: 10.10.10.19

Port: 80

Host name: www.goodshopping.com

Example: www.contoso.com or marketing.contoso.com

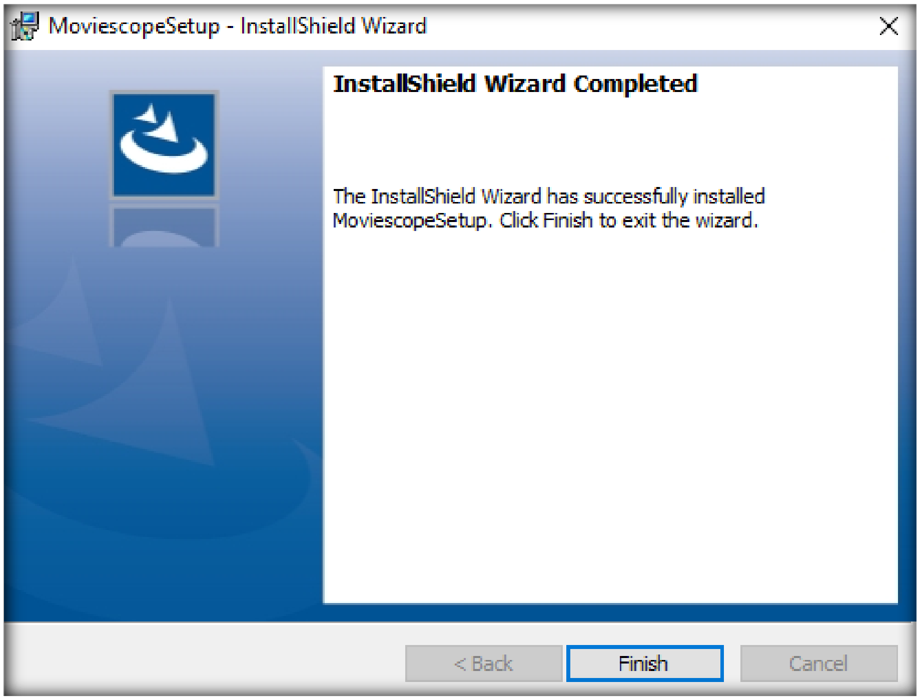
☑ Start Website immediately

34. Close all windows.

[Back to Configuration Task Outline]

# CT#37: Configure the moviescope Website on the Windows Server 2019 Virtual Machine

1. Navigate to **Z:\CEHv11 Lab Prerequisites\Websites\moviescope**.
2. Double-click on **Moviescope.exe** and follow the wizard-driven installation steps to install it.
3. After completing the installation, click **Finish**.

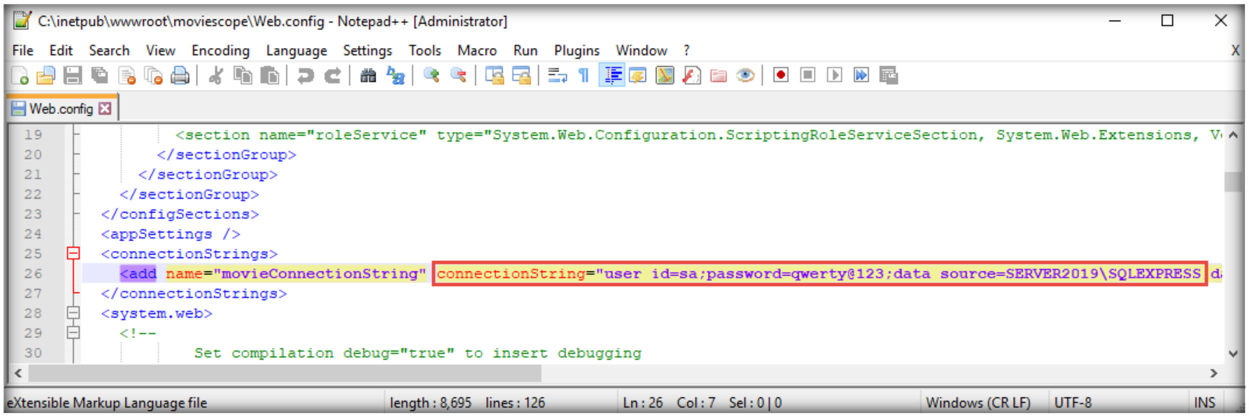

MoviescopeSetup - InstallShield Wizard
< Back
Finish
Cancel

**InstallShield Wizard Completed**

The InstallShield Wizard has successfully installed MoviescopeSetup. Click Finish to exit the wizard.

4. Open the **moviescope** folder from **C:\inetpub\wwwroot\moviescope**, and open the **Web.config** file in notepad++ or in notepad.
5. Scroll down to the **connectionString** tag on **line no. 26**, and enter your machine's name in **data source=[Provide Your Host Machine Name]\SQLEXPRESS**. Provide a user id after **user ID=sa**, and a password after **password=qwerty@123**.

   **Note**: Here, the host machine name is SERVER2019. The host machine name of the Windows Server 2019 machine might vary in your lab environment.


C:\inetpub\wwwroot\moviescope\Web.config - Notepad++ [Administrator]
File
Edit
Search
View
Encoding
Language
Settings
Tools
Macro
Run
Plugins
Window
?
Web.config
eXtensible Markup Language file
length : 8,695 lines : 126
Ln : 26 Col : 7 Sel : 0 | 0
Windows (CR LF)
UTF-8
INS

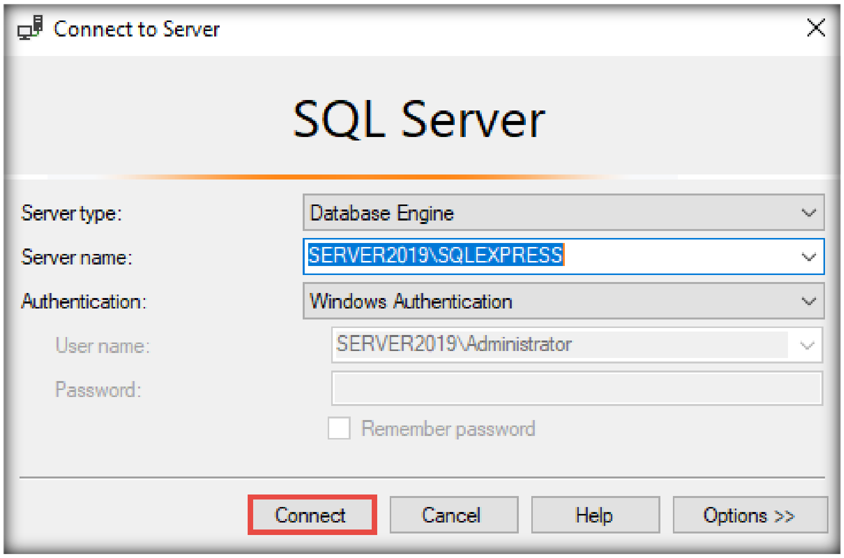
```
19              <section name="roleService" type="System.Web.Configuration.ScriptingRoleServiceSection, System.Web.Extensions, V
20            </sectionGroup>
21          </sectionGroup>
22        </sectionGroup>
23      </configSections>
24      <appSettings />
25      <connectionStrings>
26        <add name="movieConnectionString" connectionString="user id=sa;password=qwerty@123;data source=SERVER2019\SQLEXPRESS d
27      </connectionStrings>
28      <system.web>
29        <!--
30              Set compilation debug="true" to insert debugging
```

6. **Save** the file and **close** it.

7. Now, launch **Microsoft SQL Server Management Studio**.

   - Click the **Type here to search** icon (🔍) from the lower section of the **Desktop** and type **microsoft**. From the results, select **Microsoft SQL Server Management Studio 18**.

   - The **Microsoft SQL Server Management Studio** window appears along with the **Connect to Server** pop-up. In the **Connect to Server** pop-up, leave the settings to default and click the **Connect** button.

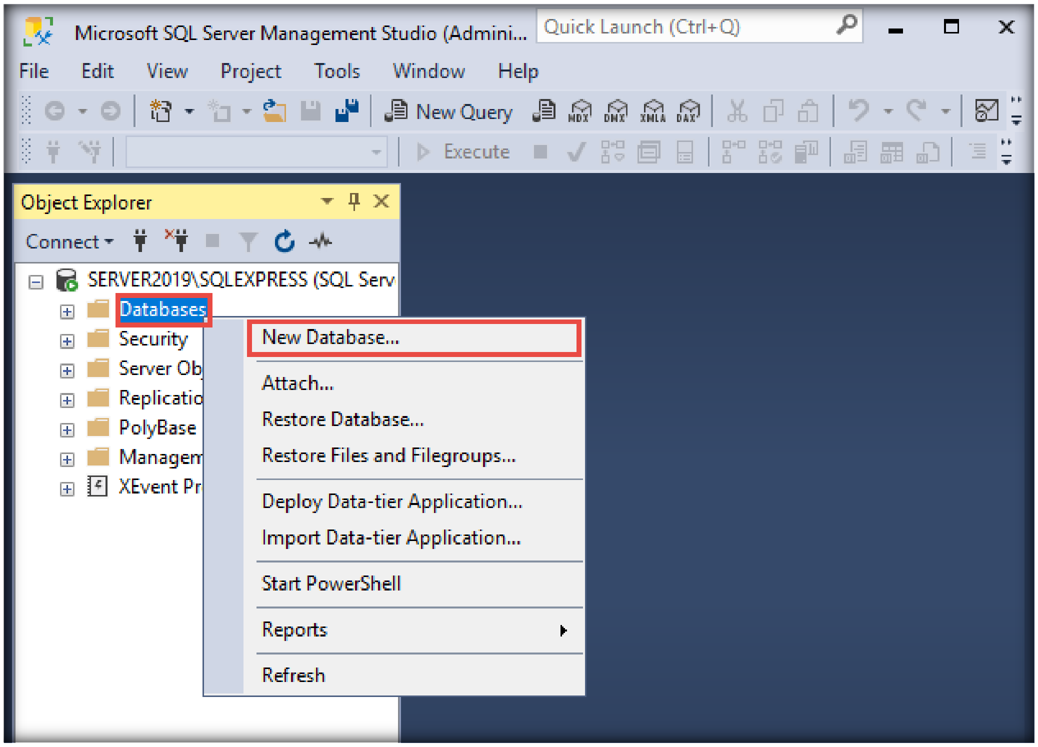


Connect to Server
SQL Server

Server type: Database Engine
Server name: SERVER2019\SQLEXPRESS
Authentication: Windows Authentication
User name: SERVER2019\Administrator
Password:
☐ Remember password

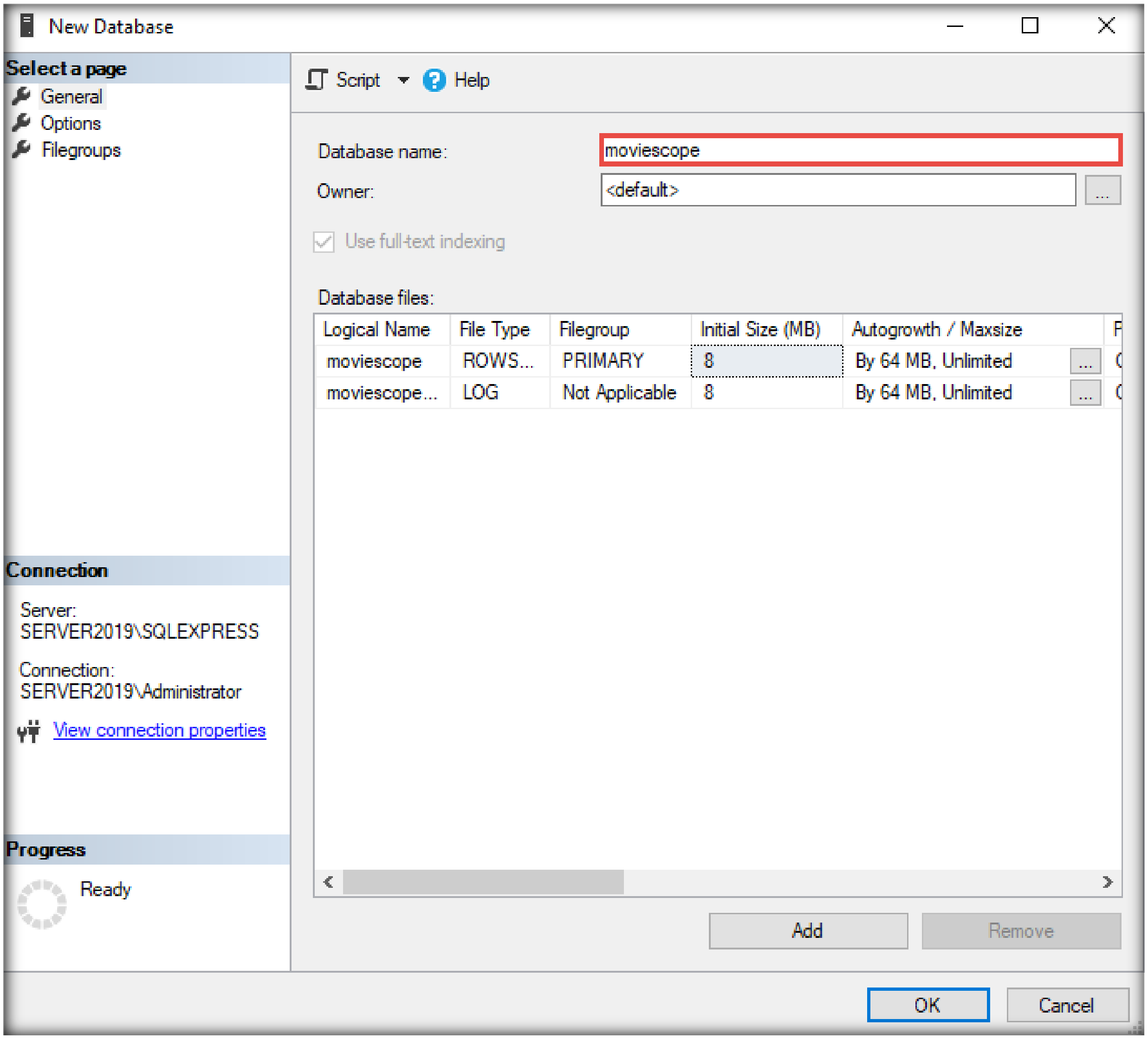
Connect
Cancel
Help
Options >>

8. In the **Microsoft SQL Server Management Studio** window, right-click on **Databases** and select **New Database...**



Microsoft SQL Server Management Studio (Admini...
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Tools
Window
Help
New Query
Execute
Object Explorer
Connect
SERVER2019\SQLEXPRESS (SQL Serv
Databases
Security
Server Ob
Replicatio
PolyBase
Managem
XEvent Pr
New Database...
Attach...
Restore Database...
Restore Files and Filegroups...
Deploy Data-tier Application...
Import Data-tier Application...
Start PowerShell
Reports
Refresh

9. The **New Database** window appears; specify the **Database name** as **moviescope**.



New Database
Select a page
General
Options
Filegroups
Script
Help

Database name: moviescope

Owner: <default>

☑ Use full-text indexing

Database files:

| Logical Name | File Type | Filegroup | Initial Size (MB) | Autogrowth / Maxsize |
|---|---|---|---|---|
| moviescope | ROWS... | PRIMARY | 8 | By 64 MB, Unlimited |
| moviescope... | LOG | Not Applicable | 8 | By 64 MB, Unlimited |

Connection

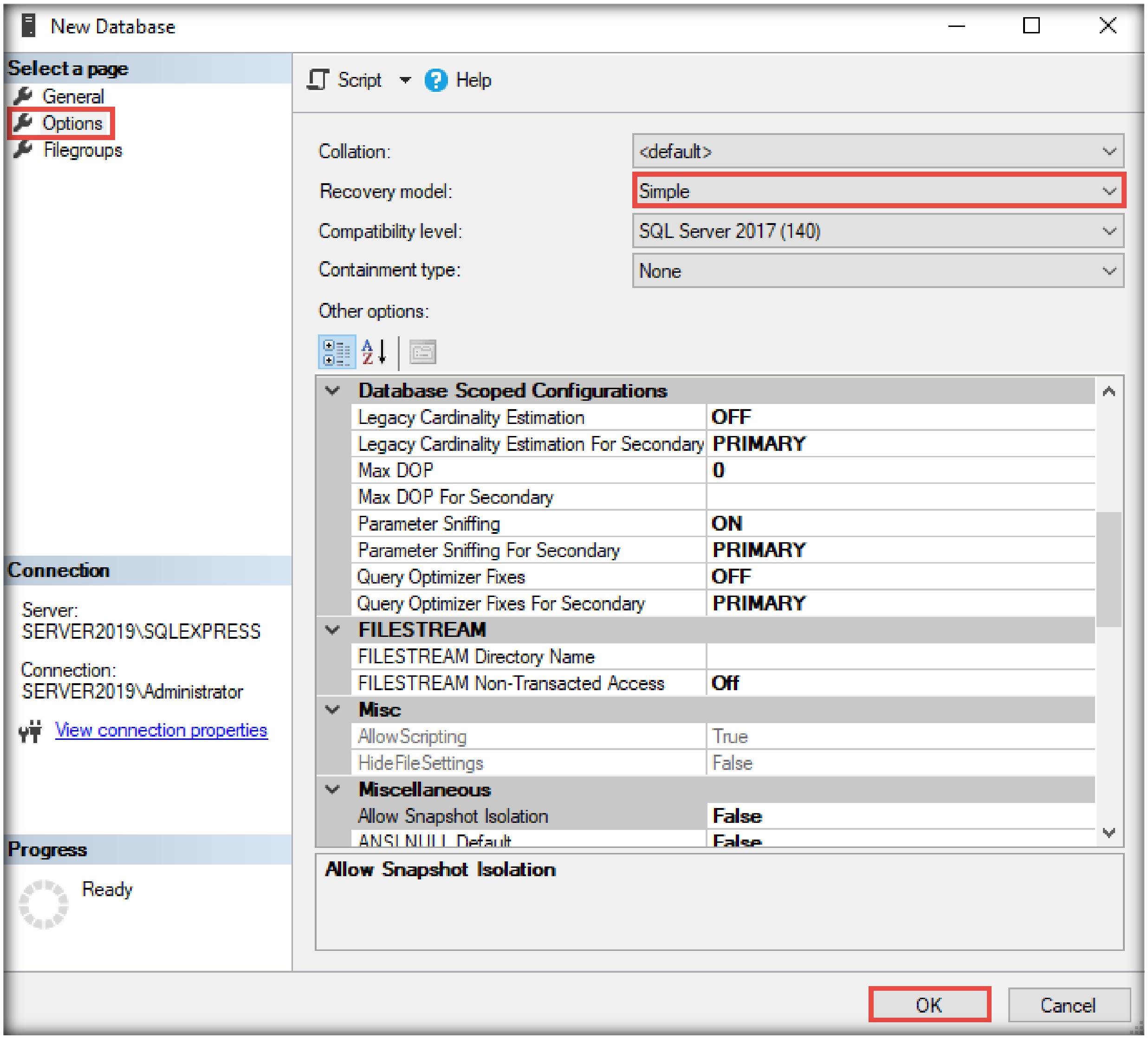
Server:
SERVER2019\SQLEXPRESS

Connection:
SERVER2019\Administrator

View connection properties
Progress
Ready
Add
Remove
OK
Cancel

10. Select **Options** from the left pane.

11. Ensure that the **Simple** option is selected in the **Recovery model** field, and click **OK**.



New Database
Select a page
General
Options
Filegroups
Script
Help
Connection
View connection properties
Progress
Ready
OK
Cancel

Server:
SERVER2019\SQLEXPRESS

Connection:
SERVER2019\Administrator

Collation: <default>

Recovery model: Simple

Compatibility level: SQL Server 2017 (140)

Containment type: None

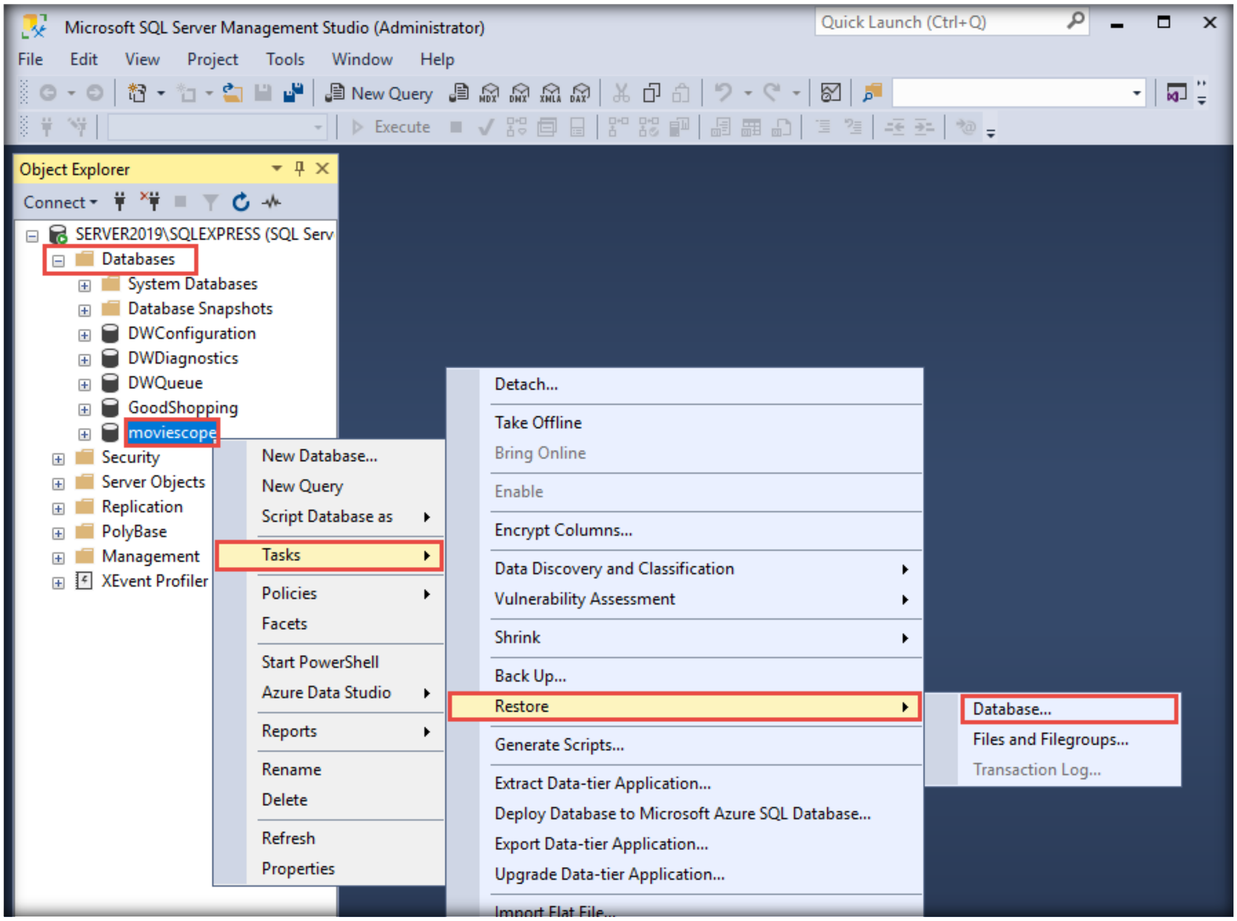
Other options:

| | |
|---|---|
| **Database Scoped Configurations** | |
| Legacy Cardinality Estimation | OFF |
| Legacy Cardinality Estimation For Secondary | PRIMARY |
| Max DOP | 0 |
| Max DOP For Secondary | |
| Parameter Sniffing | ON |
| Parameter Sniffing For Secondary | PRIMARY |
| Query Optimizer Fixes | OFF |
| Query Optimizer Fixes For Secondary | PRIMARY |
| **FILESTREAM** | |
| FILESTREAM Directory Name | |
| FILESTREAM Non-Transacted Access | Off |
| **Misc** | |
| AllowScripting | True |
| HideFileSettings | False |
| **Miscellaneous** | |
| Allow Snapshot Isolation | False |
| ANSI NULL Default | False |

**Allow Snapshot Isolation**

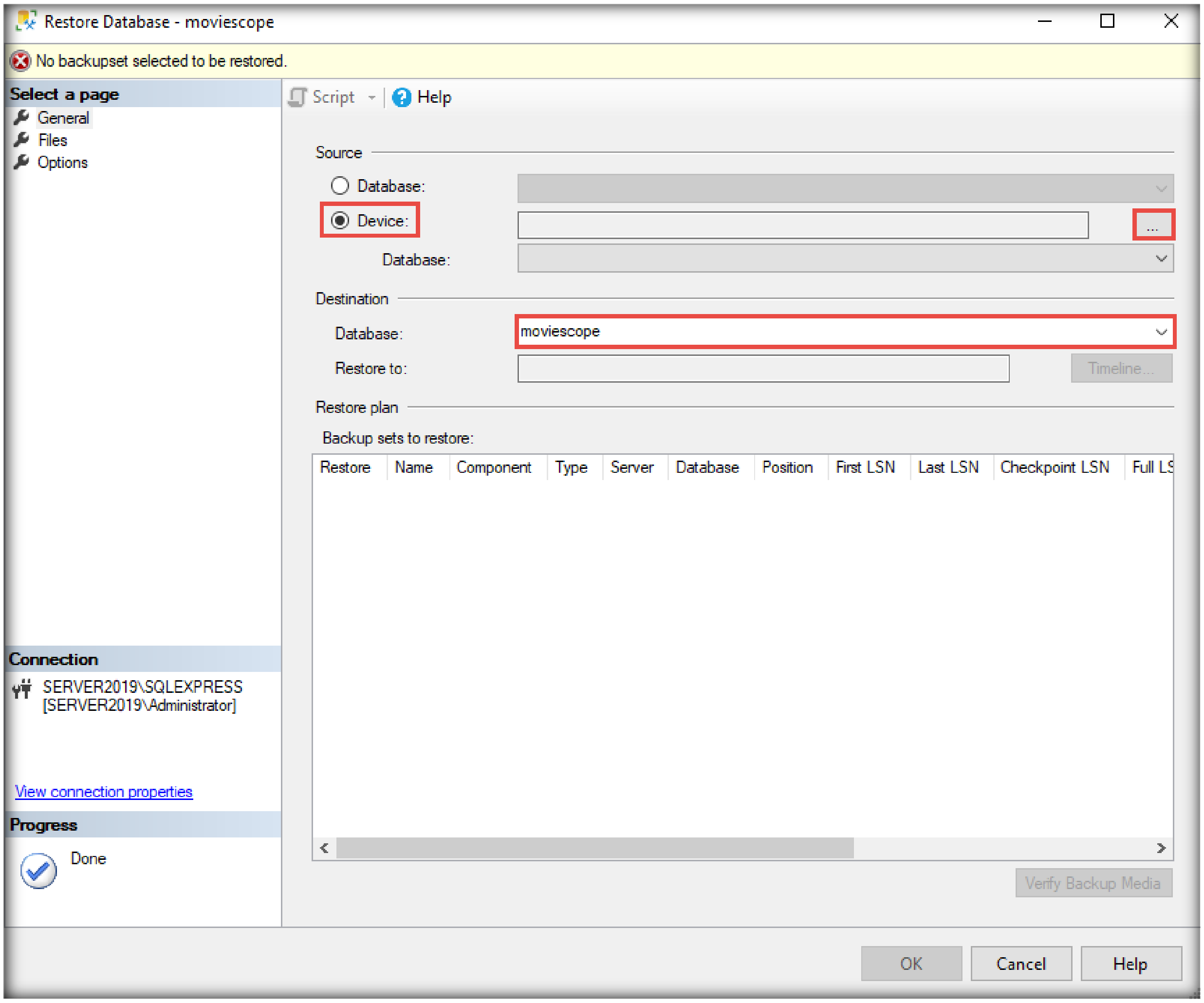
12. Now, expand the **Databases** node under the **Object Explorer** section. Observe that the **moviescope** database folder appears, which implies that it has been **successfully** created.

13. Right-click on the **moviescope** database and go to **Tasks** → **Restore** → **Database...**


Microsoft SQL Server Management Studio (Administrator)
Quick Launch (Ctrl+Q)
File Edit View Project Tools Window Help
New Query
Execute
Object Explorer
Connect
SERVER2019\SQLEXPRESS (SQL Serv
Databases
System Databases
Database Snapshots
DWConfiguration
DWDiagnostics
DWQueue
GoodShopping
moviescope
Security
Server Objects
Replication
PolyBase
Management
XEvent Profiler
New Database...
New Query
Script Database as
Tasks
Policies
Facets
Start PowerShell
Azure Data Studio
Reports
Rename
Delete
Refresh
Properties
Detach...
Take Offline
Bring Online
Enable
Encrypt Columns...
Data Discovery and Classification
Vulnerability Assessment
Shrink
Back Up...
Restore
Generate Scripts...
Extract Data-tier Application...
Deploy Database to Microsoft Azure SQL Database...
Export Data-tier Application...
Upgrade Data-tier Application...
Import Flat File...
Database...
Files and Filegroups...
Transaction Log...

14. The **Restore Database - moviescope** window appears, displaying the database name (**moviescope**) in the **Database** field under the **Destination** section.

15. Select the **Device** radio button under the **Source** section and click the ... button located parallel to the **Device** field.


Restore Database - moviescope
Select a page
General
Files
Options
Script
Help
Source
○ Database:
● Device:
...
Database:
Destination
Restore to:
Timeline...
Restore plan
Backup sets to restore:
Restore
Name
Component
Type
Server
Database
Position
First LSN
Last LSN
Checkpoint LSN
Full LS
Connection
View connection properties
Progress
Verify Backup Media
OK
Cancel
Help

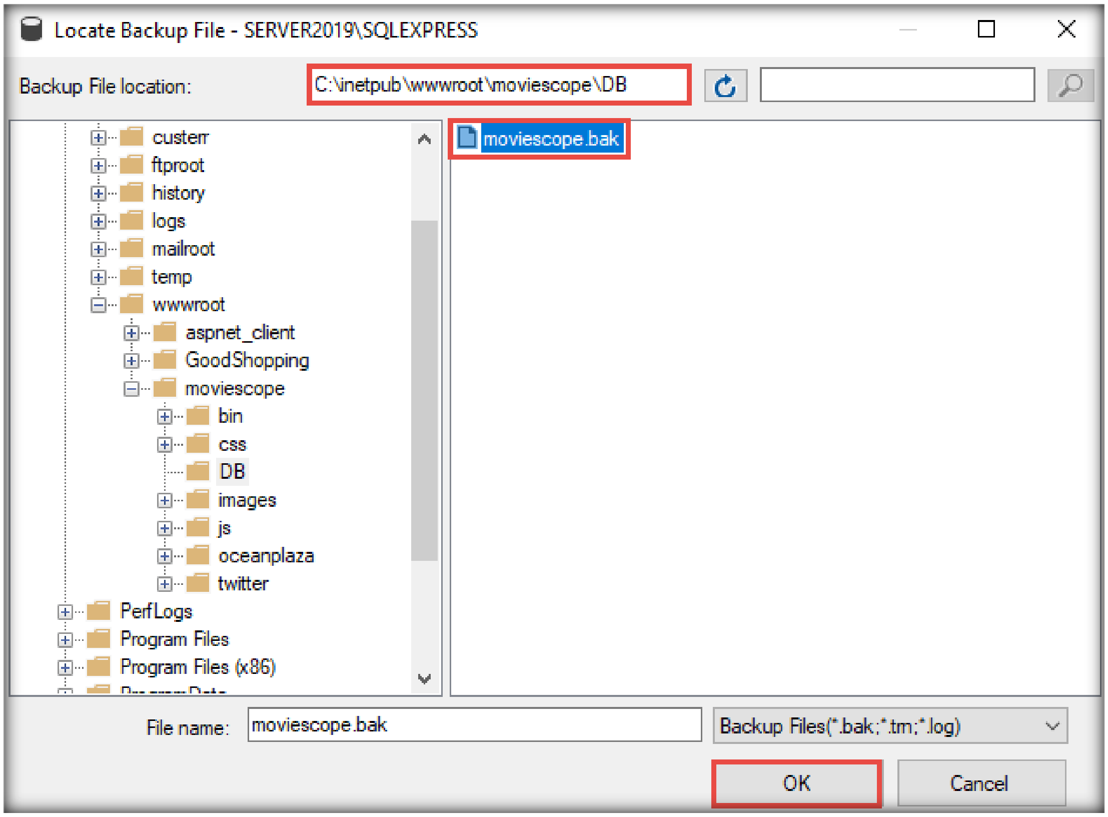
No backupset selected to be restored.

Database: moviescope

SERVER2019\SQLEXPRESS
[SERVER2019\Administrator]

Done

16. The **Select backup devices** dialog box appears; click the **Add** button.
17. In the **Locate Backup File** window, navigate to the backup file (**moviescope.bak**) located in **C:\inetpub\wwwroot\moviescope\DB**.
18. Select the backup file, and then click **OK**.



Locate Backup File - SERVER2019\SQLEXPRESS

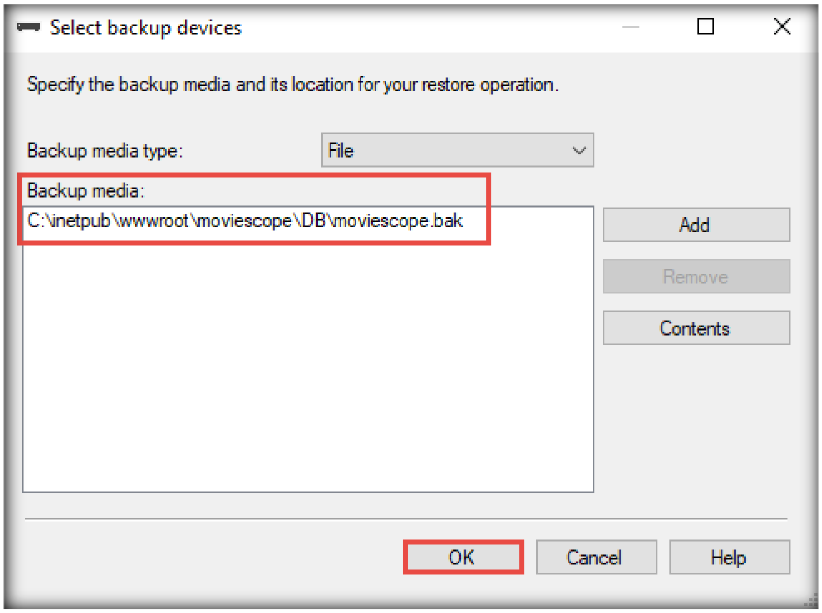
Backup File location: C:\inetpub\wwwroot\moviescope\DB

File name: moviescope.bak

Backup Files(*.bak;*.tm;*.log)

custerr
ftproot
history
logs
mailroot
temp
wwwroot
aspnet_client
GoodShopping
moviescope
bin
css
DB
images
js
oceanplaza
twitter
PerfLogs
Program Files
Program Files (x86)
moviescope.bak
OK
Cancel

19. In the **Select backup devices** window, the location of **moviescope.bak** website is listed under the **Backup media** section. Then, click **OK**.



Select backup devices

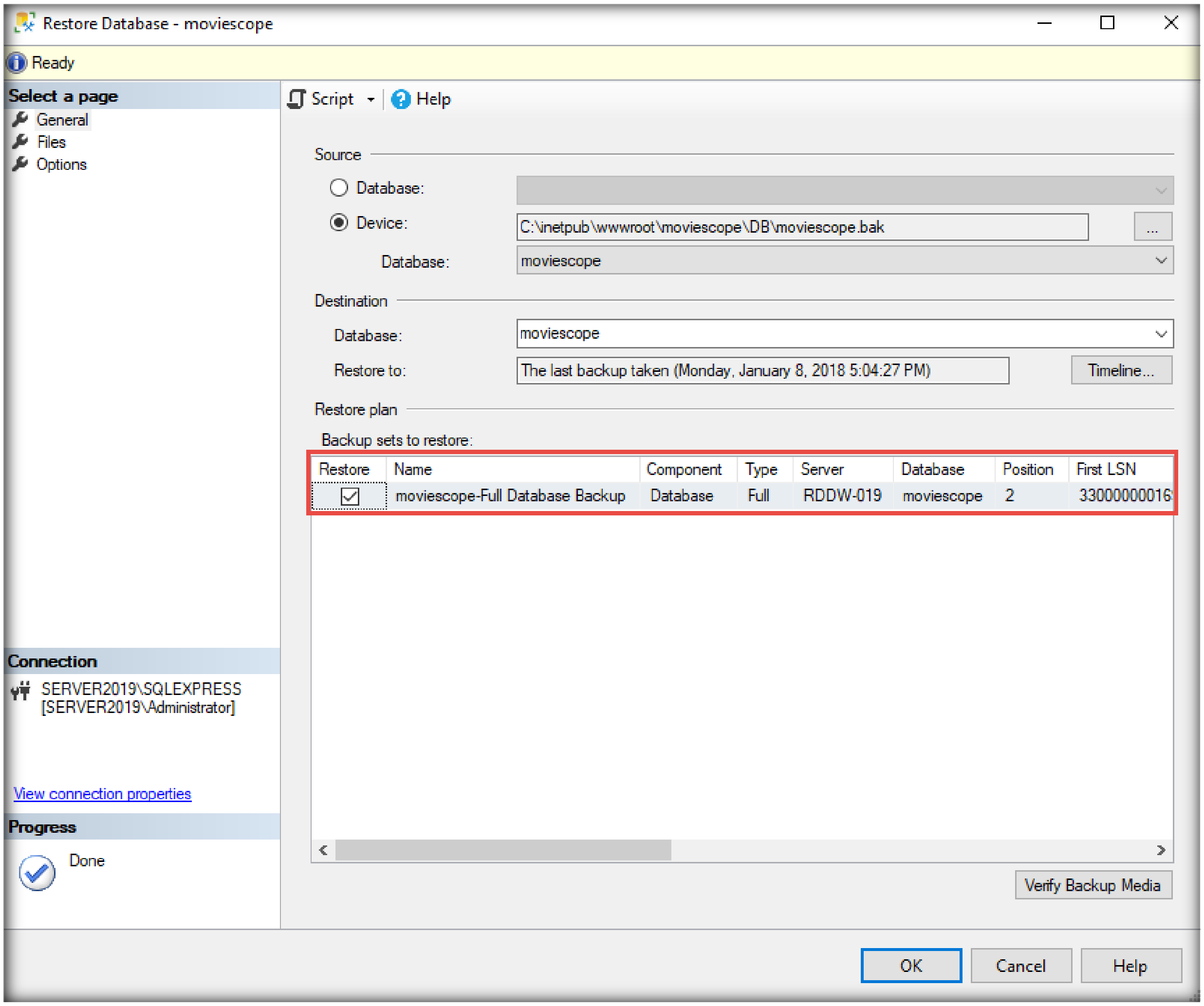
Specify the backup media and its location for your restore operation.

Backup media type: File

Backup media:
C:\inetpub\wwwroot\moviescope\DB\moviescope.bak

Add
Remove
Contents
OK
Cancel
Help

20. Observe that the backup file has been successfully added. Ensure that the backup file is checked.



Restore Database - moviescope
Ready
Select a page
General
Files
Options
Script
Help
Connection
View connection properties
Progress
Timeline...
Verify Backup Media
OK
Cancel
Help

Source
○ Database:
● Device: C:\inetpub\wwwroot\moviescope\DB\moviescope.bak
Database: moviescope

Destination
Database: moviescope
Restore to: The last backup taken (Monday, January 8, 2018 5:04:27 PM)

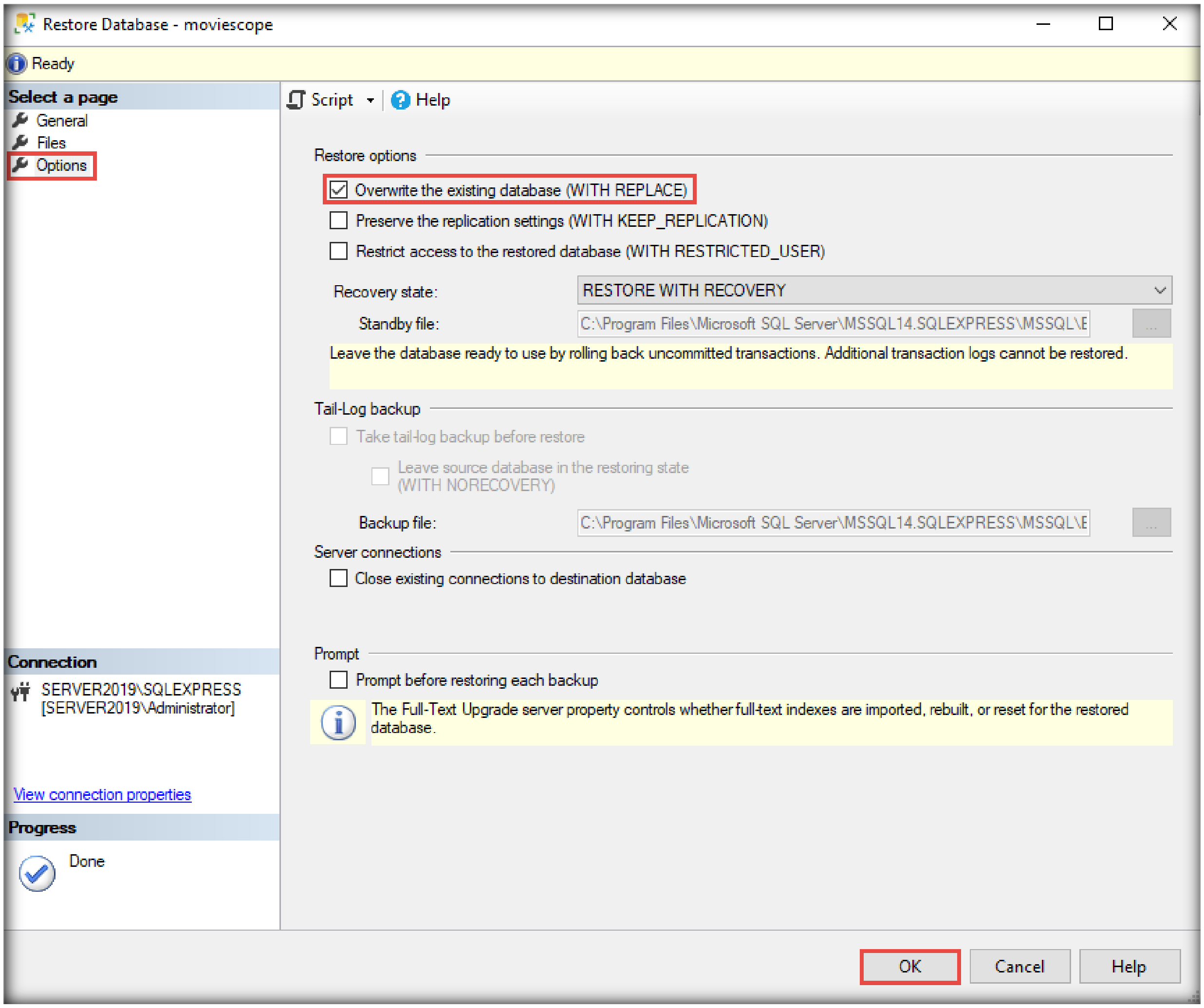
Restore plan
Backup sets to restore:

| Restore | Name | Component | Type | Server | Database | Position | First LSN |
|---|---|---|---|---|---|---|---|
| ☑ | moviescope-Full Database Backup | Database | Full | RDDW-019 | moviescope | 2 | 33000000016 |

Connection: SERVER2019\SQLEXPRESS [SERVER2019\Administrator]

Progress: Done

21. Click **Options** in the left pane, check **Overwrite the existing database (WITH REPLACE)** under **Restore options** section, and then click **OK**.



Restore options

☑ Overwrite the existing database (WITH REPLACE)

☐ Preserve the replication settings (WITH KEEP_REPLICATION)

☐ Restrict access to the restored database (WITH RESTRICTED_USER)

Recovery state: RESTORE WITH RECOVERY

Standby file: C:\Program Files\Microsoft SQL Server\MSSQL14.SQLEXPRESS\MSSQL\E

Leave the database ready to use by rolling back uncommitted transactions. Additional transaction logs cannot be restored.

Tail-Log backup

☐ Take tail-log backup before restore

☐ Leave source database in the restoring state (WITH NORECOVERY)

Backup file: C:\Program Files\Microsoft SQL Server\MSSQL14.SQLEXPRESS\MSSQL\E

Server connections

☐ Close existing connections to destination database

Prompt

☐ Prompt before restoring each backup

The Full-Text Upgrade server property controls whether full-text indexes are imported, rebuilt, or reset for the restored database.

SERVER2019\SQLEXPRESS
[SERVER2019\Administrator]

Done

22. **The Microsoft SQL Server Management Studio** pop-up appears, stating that the database has been successfully created. Then, click **OK**.

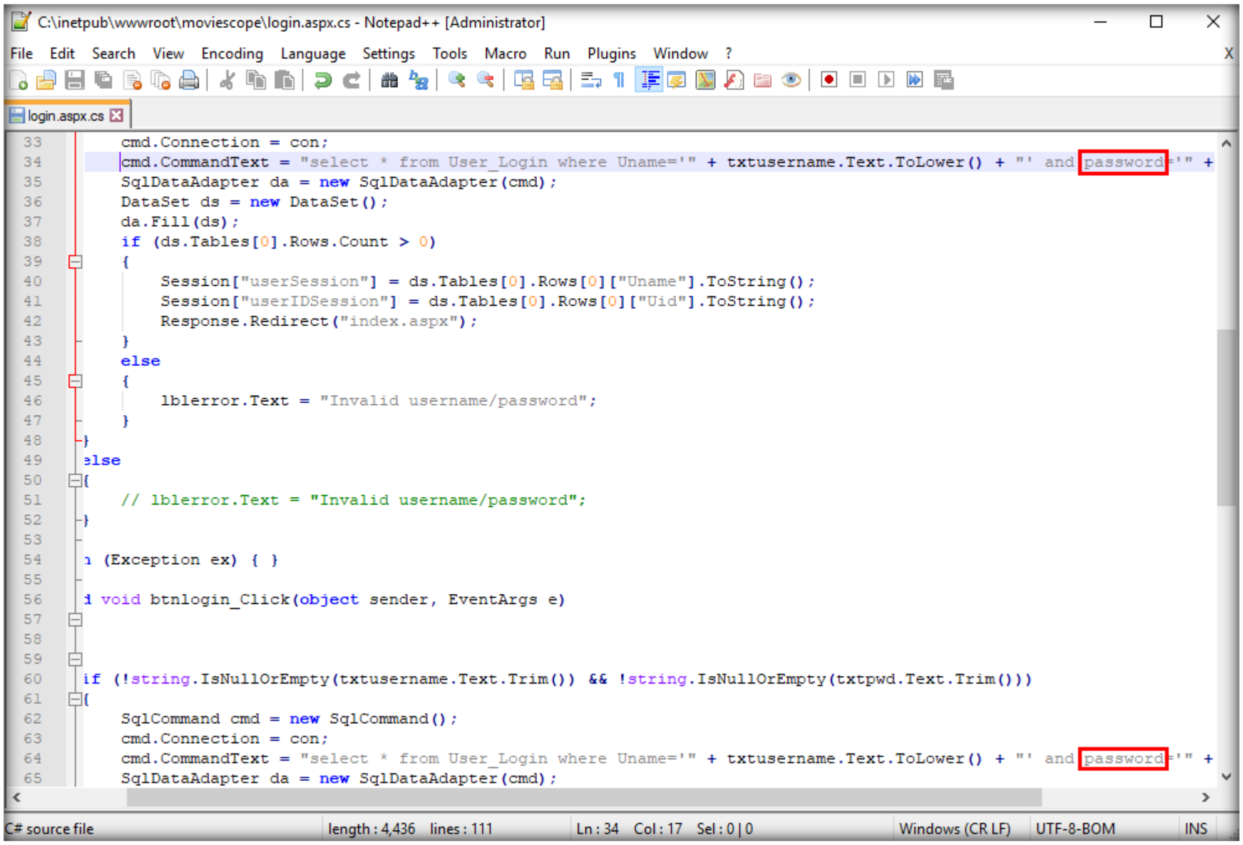
23. You have successfully **restored** the **database** of moviescope on your machine.

24. Close the **Microsoft SQL Server Management Studio** window.

25. Follow steps **28–34** from the previous GoodShopping configuration task to configure the MovieScope site as **www.moviescope.com**.

26. Now, navigate to the location **C:\inetpub\wwwroot\moviescope** and open the **login.aspx.cs** file in **notepad++** or **in notepad**.

27. Scroll down to the **cmd.CommandText** tag on **lines no. 34 & 64** and replace the keyword **Upwd** with **password** in both the lines.


C:\inetpub\wwwroot\moviescope\login.aspx.cs - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
login.aspx.cs

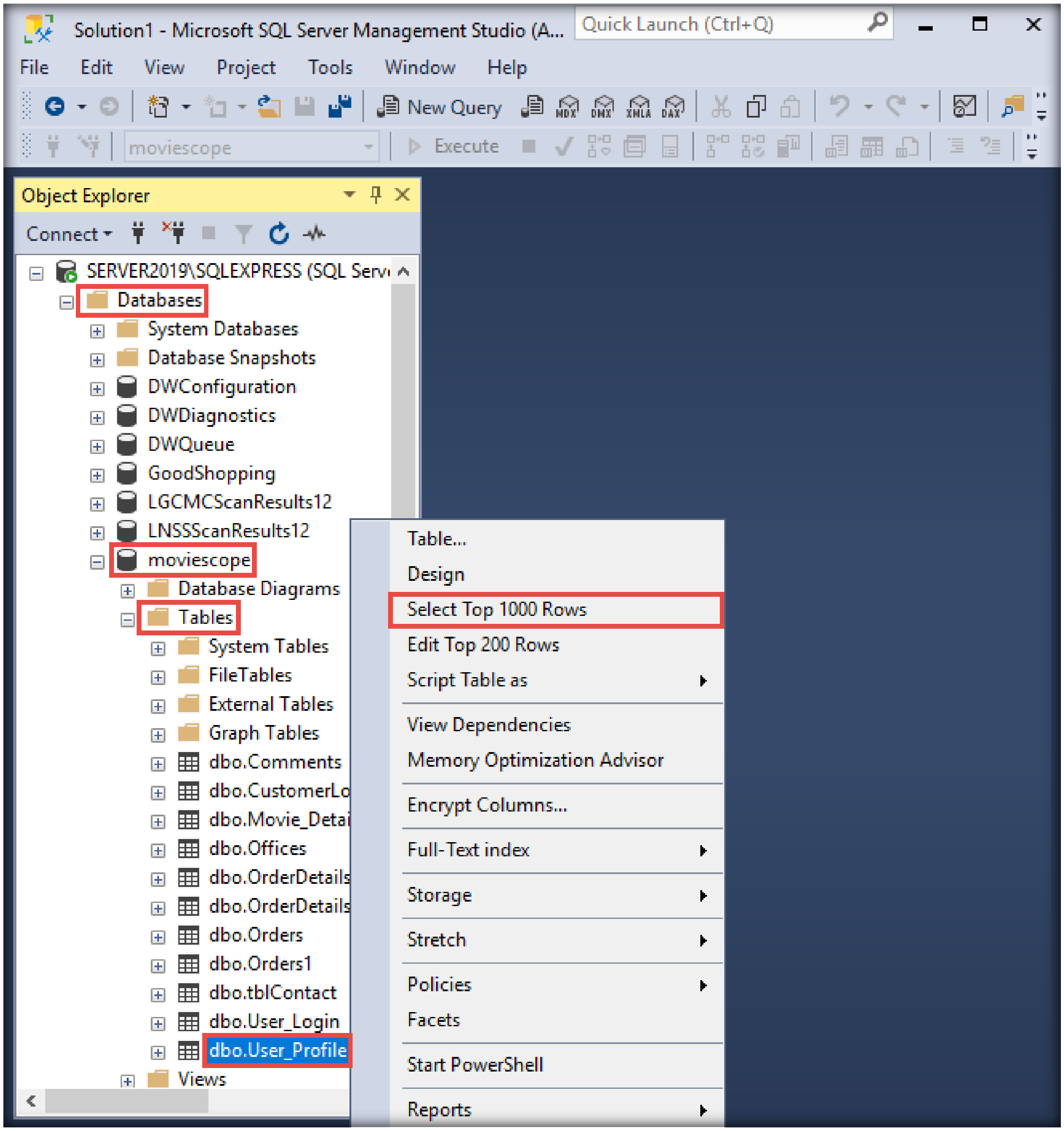
```
33          cmd.Connection = con;
34          cmd.CommandText = "select * from User_Login where Uname='" + txtusername.Text.ToLower() + "' and password='" +
35          SqlDataAdapter da = new SqlDataAdapter(cmd);
36          DataSet ds = new DataSet();
37          da.Fill(ds);
38          if (ds.Tables[0].Rows.Count > 0)
39          {
40              Session["userSession"] = ds.Tables[0].Rows[0]["Uname"].ToString();
41              Session["userIDSession"] = ds.Tables[0].Rows[0]["Uid"].ToString();
42              Response.Redirect("index.aspx");
43          }
44          else
45          {
46              lblerror.Text = "Invalid username/password";
47          }
48      }
49      else
50      {
51          // lblerror.Text = "Invalid username/password";
52      }
53
54      h (Exception ex) { }
55
56      d void btnlogin_Click(object sender, EventArgs e)
57
58
59
60      if (!string.IsNullOrEmpty(txtusername.Text.Trim()) && !string.IsNullOrEmpty(txtpwd.Text.Trim()))
61      {
62          SqlCommand cmd = new SqlCommand();
63          cmd.Connection = con;
64          cmd.CommandText = "select * from User_Login where Uname='" + txtusername.Text.ToLower() + "' and password='" +
65          SqlDataAdapter da = new SqlDataAdapter(cmd);
```

C# source file
length : 4,436 lines : 111
Ln : 34 Col : 17 Sel : 0 | 0
Windows (CR LF)
UTF-8-BOM
INS

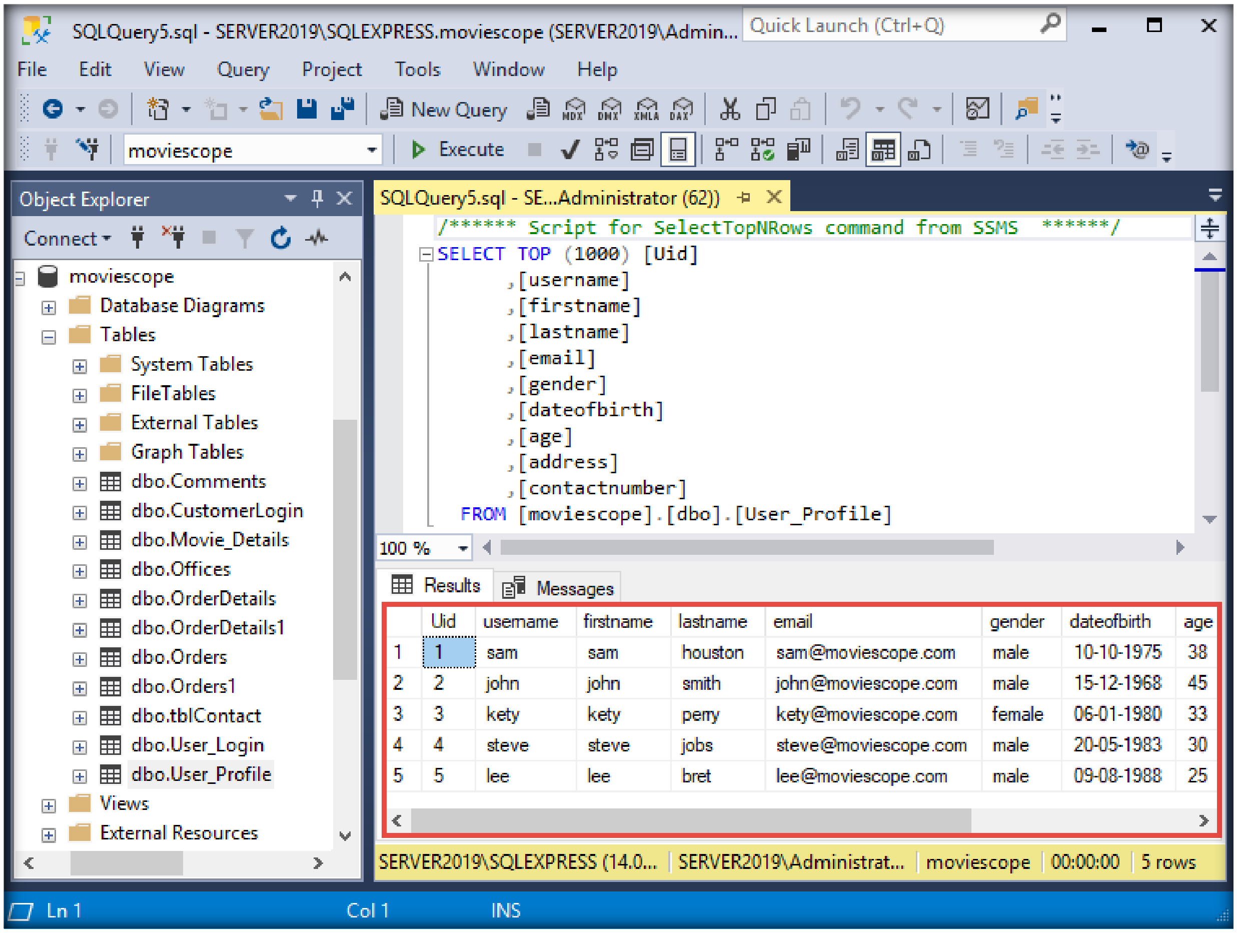
28. **Save** the file and **close** it.

29. Click the **Type here to search** icon () from the lower section of **Desktop** and type **microsoft**. From the results, click **Microsoft SQL Server Management Studio**.

30. The **Microsoft SQL Server Management Studio** window appears; click **Connect**. Expand the **Databases** node and the **moviescope** node from the left-hand pane. Under the **moviescope** node, expand the **Tables** node; and from the available tables under the **Tables** node, right-click the **dbo.User_Profile** table. From the context menu, select the **Select Top 1000 Rows** option.


Solution1 - Microsoft SQL Server Management Studio (A...
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect
SERVER2019\SQLEXPRESS (SQL Serv
Databases
System Databases
Database Snapshots
DWConfiguration
DWDiagnostics
DWQueue
GoodShopping
LGCMCScanResults12
LNSSScanResults12
moviescope
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
dbo.Comments
dbo.CustomerLo
dbo.Movie_Detai
dbo.Offices
dbo.OrderDetails
dbo.OrderDetails
dbo.Orders
dbo.Orders1
dbo.tblContact
dbo.User_Login
dbo.User_Profile
Views
Table...
Design
Select Top 1000 Rows
Edit Top 200 Rows
Script Table as
View Dependencies
Memory Optimization Advisor
Encrypt Columns...
Full-Text index
Storage
Stretch
Policies
Facets
Start PowerShell
Reports

31. The content of the **dbo.User_Profile** table appears, as shown in the screenshot.

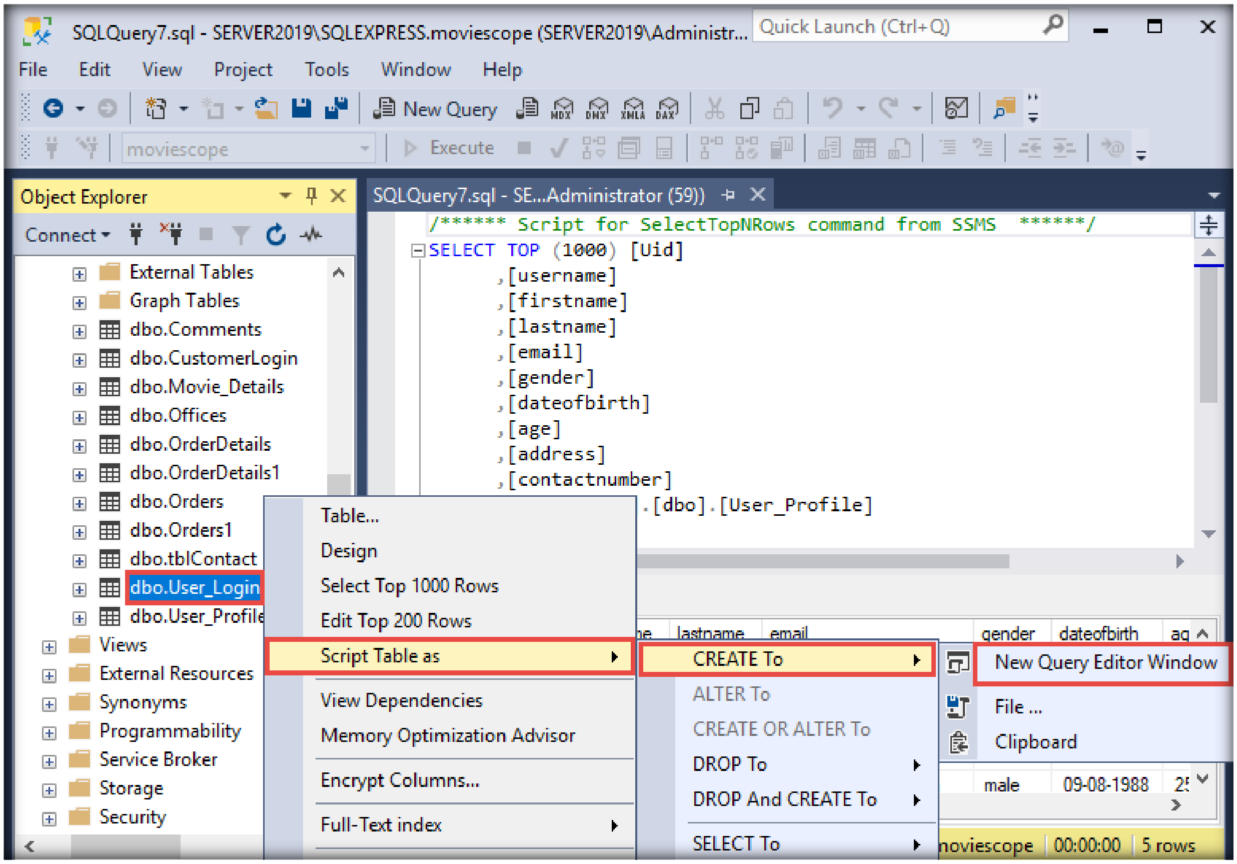

SQLQuery5.sql - SERVER2019\SQLEXPRESS.moviescope (SERVER2019\Admin...
Quick Launch (Ctrl+Q)
File
Edit
View
Query
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect
moviescope
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
dbo.Comments
dbo.CustomerLogin
dbo.Movie_Details
dbo.Offices
dbo.OrderDetails
dbo.OrderDetails1
dbo.Orders
dbo.Orders1
dbo.tblContact
dbo.User_Login
dbo.User_Profile
Views
External Resources
SQLQuery5.sql - SE...Administrator (62))
100 %
Results
Messages
SERVER2019\SQLEXPRESS (14.0...
SERVER2019\Administrat...
moviescope
00:00:00
5 rows
Ln 1
Col 1
INS

```sql
/****** Script for SelectTopNRows command from SSMS  ******/
SELECT TOP (1000) [Uid]
      ,[username]
      ,[firstname]
      ,[lastname]
      ,[email]
      ,[gender]
      ,[dateofbirth]
      ,[age]
      ,[address]
      ,[contactnumber]
  FROM [moviescope].[dbo].[User_Profile]
```

| | Uid | username | firstname | lastname | email | gender | dateofbirth | age |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | sam | sam | houston | sam@moviescope.com | male | 10-10-1975 | 38 |
| 2 | 2 | john | john | smith | john@moviescope.com | male | 15-12-1968 | 45 |
| 3 | 3 | kety | kety | perry | kety@moviescope.com | female | 06-01-1980 | 33 |
| 4 | 4 | steve | steve | jobs | steve@moviescope.com | male | 20-05-1983 | 30 |
| 5 | 5 | lee | lee | bret | lee@moviescope.com | male | 09-08-1988 | 25 |

32. Write down the values in the **dbo.User_Profile** table, as we will add these values to the **dbo.User_Login** table.

33. Now, from the left pane under the **Tables** node, right-click on the **dbo.User_Login** table and navigate to **Script Table as** → **CREATE To** → **New Query Editor Window**.

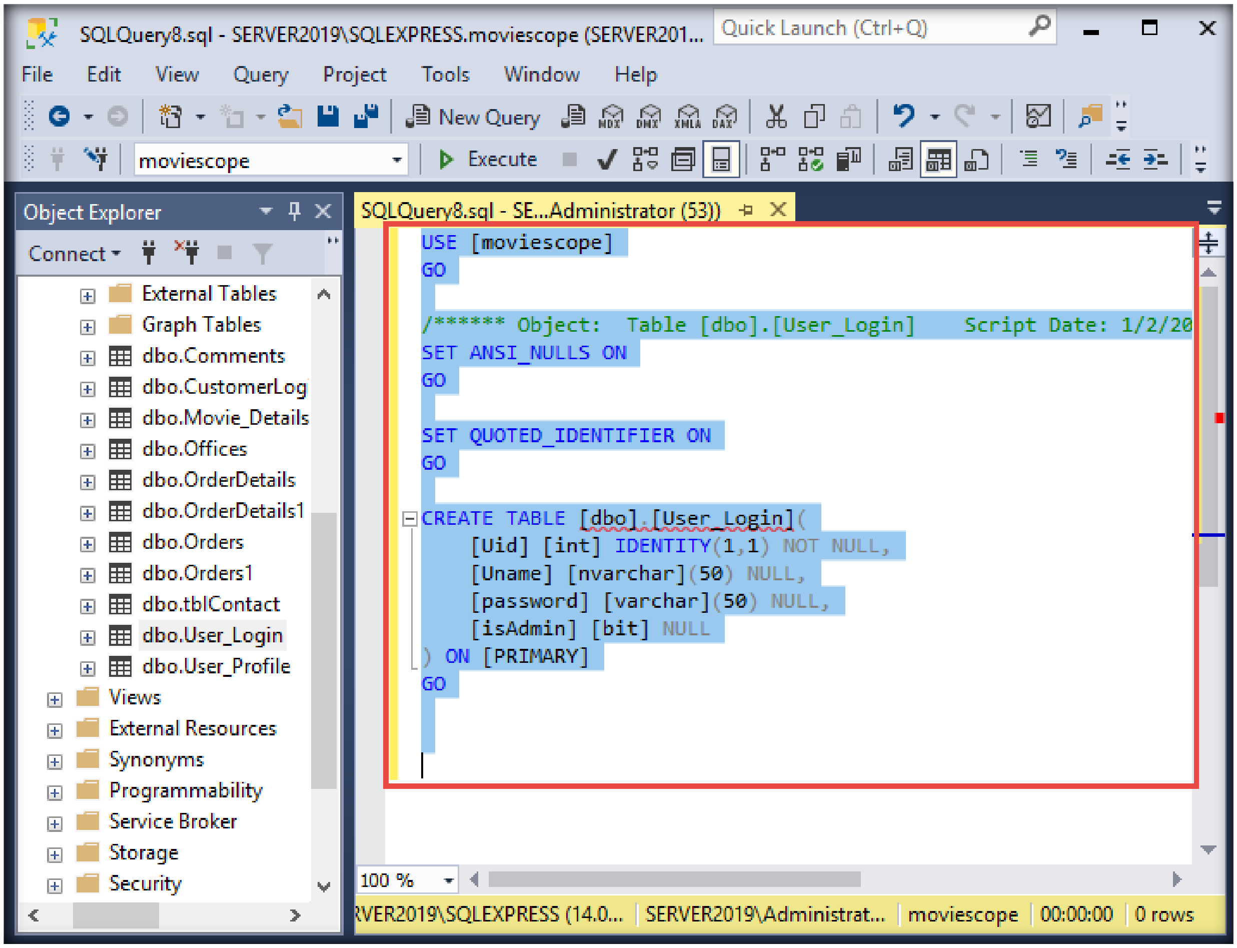


```
/****** Script for SelectTopNRows command from SSMS  ******/
SELECT TOP (1000) [Uid]
      ,[username]
      ,[firstname]
      ,[lastname]
      ,[email]
      ,[gender]
      ,[dateofbirth]
      ,[age]
      ,[address]
      ,[contactnumber]
                  .[dbo].[User_Profile]
```

SQLQuery7.sql - SERVER2019\SQLEXPRESS.moviescope (SERVER2019\Administr...
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
SQLQuery7.sql - SE...Administrator (59))
Connect
External Tables
Graph Tables
dbo.Comments
dbo.CustomerLogin
dbo.Movie_Details
dbo.Offices
dbo.OrderDetails
dbo.OrderDetails1
dbo.Orders
dbo.Orders1
dbo.tblContact
dbo.User_Login
dbo.User_Profile
Views
External Resources
Synonyms
Programmability
Service Broker
Storage
Security
Table...
Design
Select Top 1000 Rows
Edit Top 200 Rows
Script Table as
View Dependencies
Memory Optimization Advisor
Encrypt Columns...
Full-Text index
CREATE To
ALTER To
CREATE OR ALTER To
DROP To
DROP And CREATE To
SELECT To
New Query Editor Window
File ...
Clipboard
lastname
email
gender
dateofbirth
ag
male
09-08-1988
moviescope
00:00:00
5 rows

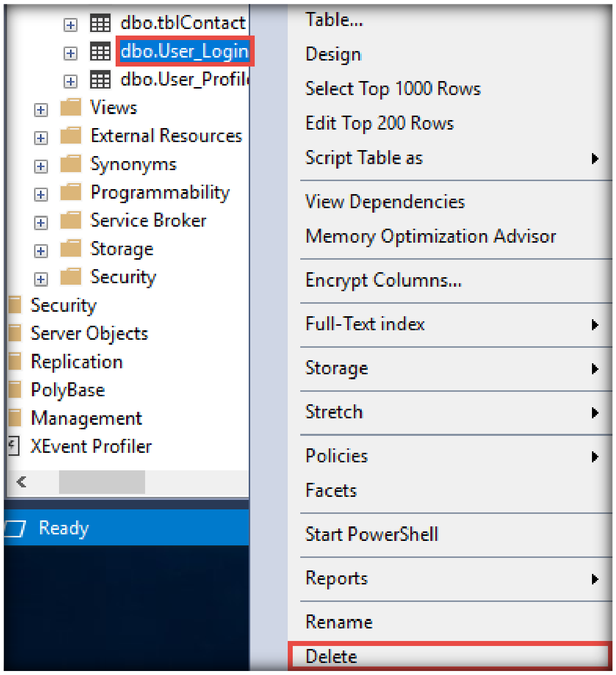
34. A query tab appears. Press **Ctrl+A** to select the query and press **Ctrl+C** to copy it.

    **Note**: We will use this SQL query to create a new table.


SQLQuery8.sql - SERVER2019\SQLEXPRESS.moviescope (SERVER201...
Quick Launch (Ctrl+Q)
File
Edit
View
Query
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect
External Tables
Graph Tables
dbo.Comments
dbo.CustomerLog
dbo.Movie_Details
dbo.Offices
dbo.OrderDetails
dbo.OrderDetails1
dbo.Orders
dbo.Orders1
dbo.tblContact
dbo.User_Login
dbo.User_Profile
Views
External Resources
Synonyms
Programmability
Service Broker
Storage
Security
SQLQuery8.sql - SE...Administrator (53))
100 %
RVER2019\SQLEXPRESS (14.0...
SERVER2019\Administrat...
moviescope
00:00:00
0 rows

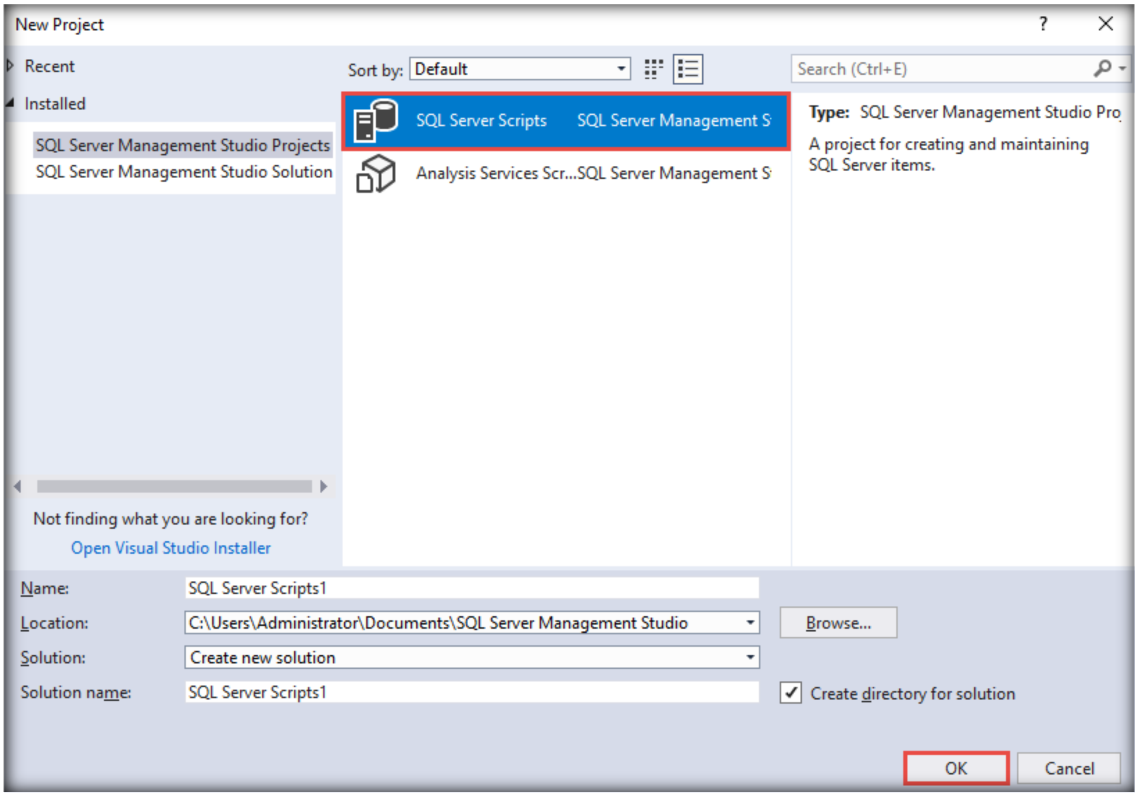
```
USE [moviescope]
GO

/****** Object:  Table [dbo].[User_Login]    Script Date: 1/2/20
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[User_Login](
    [Uid] [int] IDENTITY(1,1) NOT NULL,
    [Uname] [nvarchar](50) NULL,
    [password] [varchar](50) NULL,
    [isAdmin] [bit] NULL
) ON [PRIMARY]
GO
```

35. Right-click **dbo.User_Login** table from the left-hand pane and click **Delete** from the options to drop the table.


dbo.tblContact
dbo.User_Login
dbo.User_Profil
Views
External Resources
Synonyms
Programmability
Service Broker
Storage
Security
Security
Server Objects
Replication
PolyBase
Management
XEvent Profiler
Ready
Table...
Design
Select Top 1000 Rows
Edit Top 200 Rows
Script Table as
View Dependencies
Memory Optimization Advisor
Encrypt Columns...
Full-Text index
Storage
Stretch
Policies
Facets
Start PowerShell
Reports
Rename
Delete

36. In the **Delete Object** window, click the **OK** button. The table is deleted.

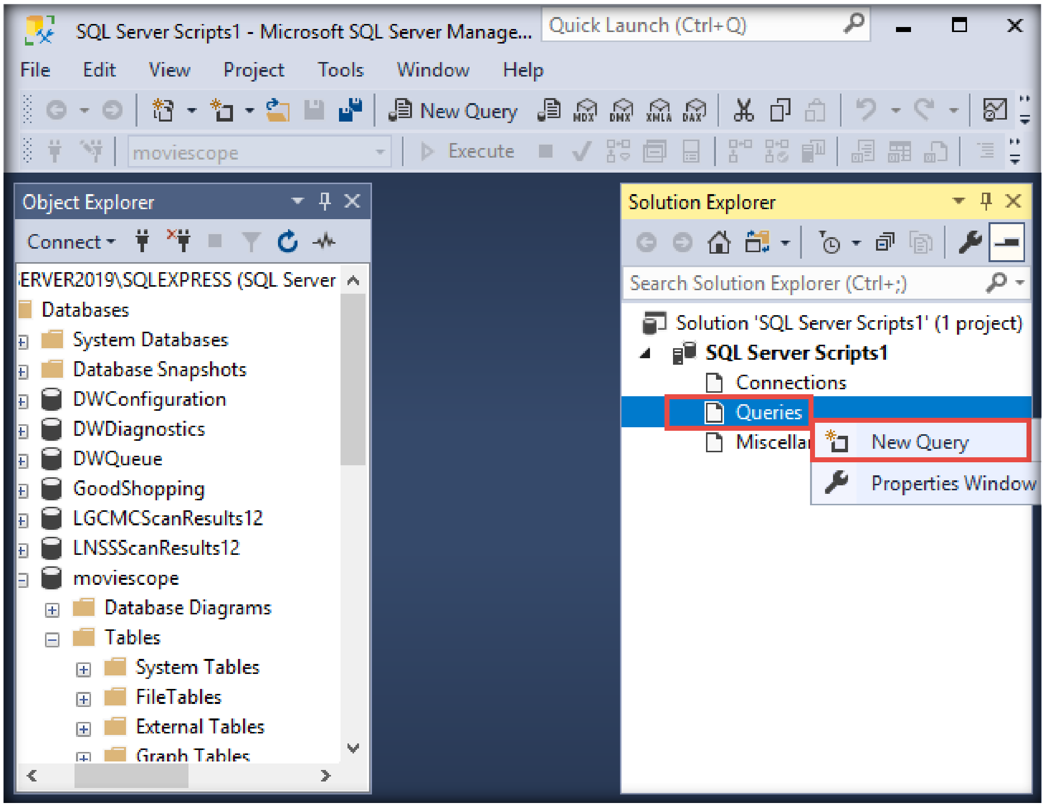
37. Now, click the **New Project** icon ( ) from the toolbar. A **New Project** window appears; select **SQL Server Scripts** and click **OK**.


New Project
?
Recent
Installed
SQL Server Management Studio Projects
SQL Server Management Studio Solution
Sort by: Default
Search (Ctrl+E)
SQL Server Scripts
SQL Server Management S
Analysis Services Scr...SQL Server Management S
Not finding what you are looking for?
Open Visual Studio Installer
Browse...
OK
Cancel

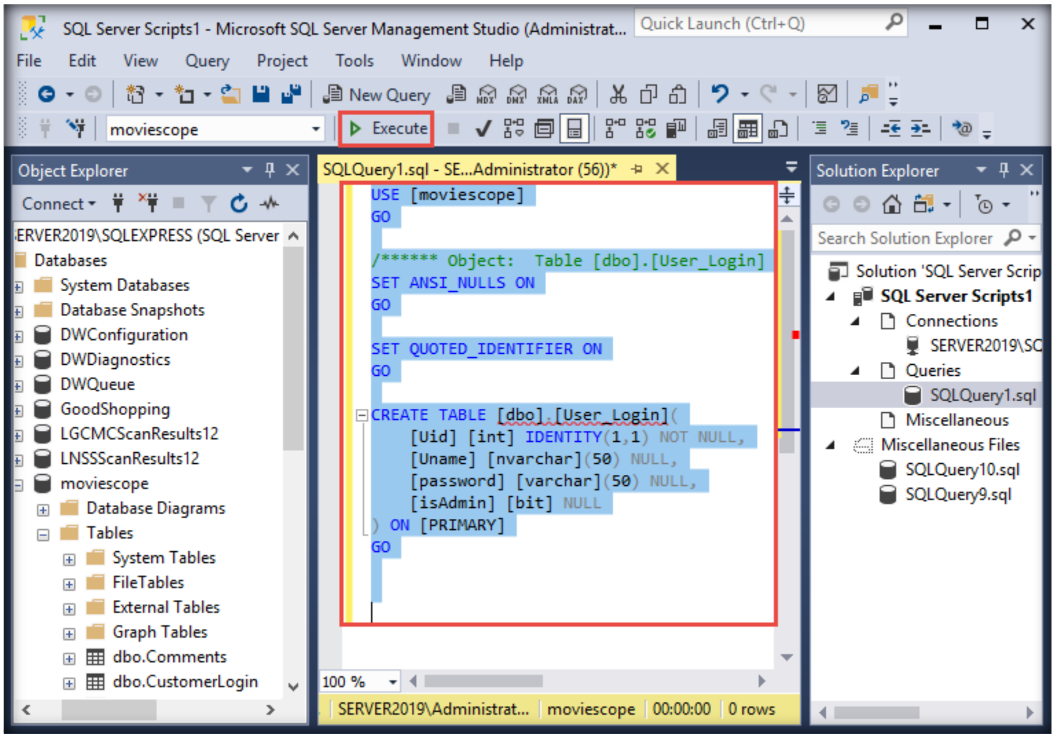
**Type:** SQL Server Management Studio Pro
A project for creating and maintaining SQL Server items.

Name: SQL Server Scripts1
Location: C:\Users\Administrator\Documents\SQL Server Management Studio
Solution: Create new solution
Solution name: SQL Server Scripts1
☑ Create directory for solution

38. The **Solution Explorer** pane appears on the right side of the window. Right-click the **Queries** option and click **New Query**.

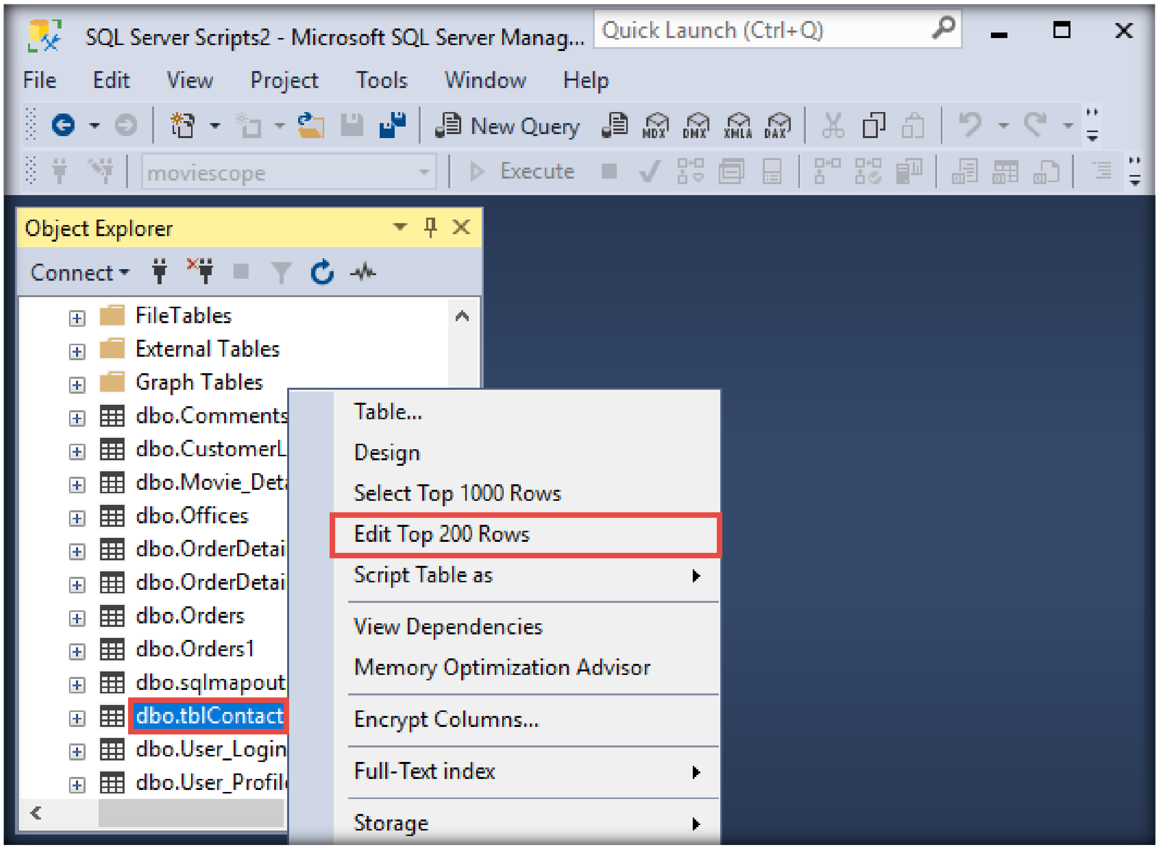

SQL Server Scripts1 - Microsoft SQL Server Manage...
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect
ERVER2019\SQLEXPRESS (SQL Server
Databases
System Databases
Database Snapshots
DWConfiguration
DWDiagnostics
DWQueue
GoodShopping
LGCMCScanResults12
LNSSScanResults12
moviescope
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'SQL Server Scripts1' (1 project)
SQL Server Scripts1
Connections
Queries
Miscellan
New Query
Properties Window

39. Press **Ctrl+V** to paste the SQL query copied in **Step 34**. Press **Ctrl+A** to select the query and click **Execute** from the toolbar to execute the query.

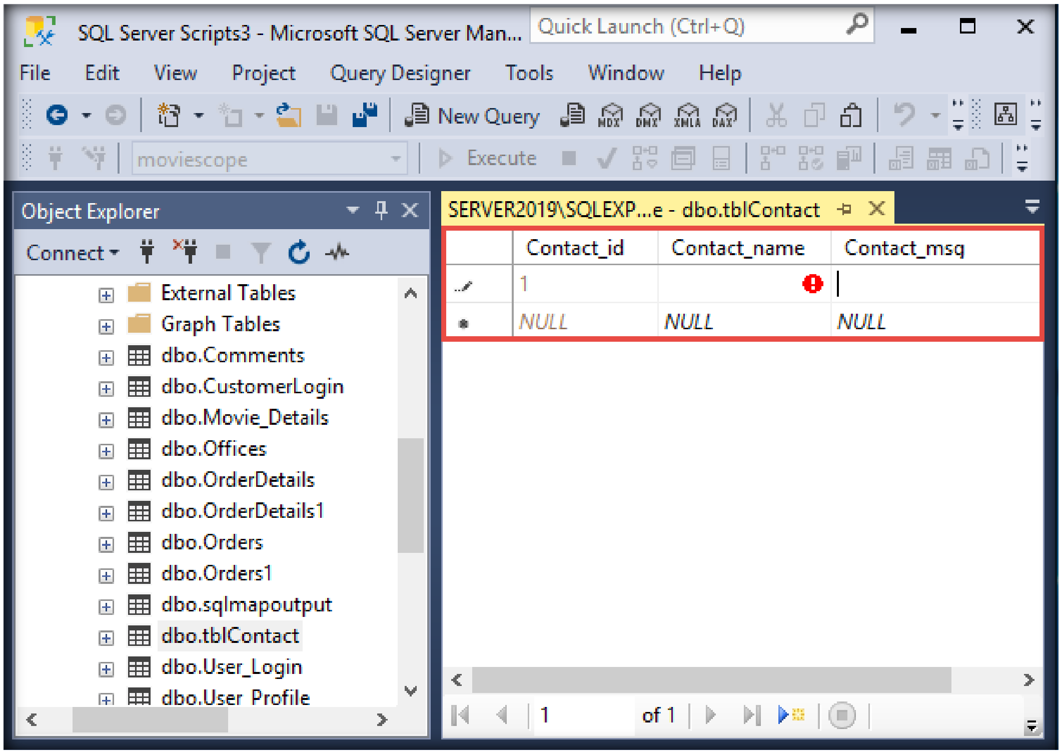

SQL Server Scripts1 - Microsoft SQL Server Management Studio (Administrat...
Quick Launch (Ctrl+Q)
File
Edit
View
Query
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect
ERVER2019\SQLEXPRESS (SQL Server
Databases
System Databases
Database Snapshots
DWConfiguration
DWDiagnostics
DWQueue
GoodShopping
LGCMCScanResults12
LNSSScanResults12
moviescope
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
dbo.Comments
dbo.CustomerLogin
SQLQuery1.sql - SE...Administrator (56))*
100 %
SERVER2019\Administrat...
moviescope
00:00:00
0 rows
Solution Explorer
Search Solution Explorer
Solution 'SQL Server Scrip
SQL Server Scripts1
Connections
SERVER2019\SQ
Queries
SQLQuery1.sql
Miscellaneous
Miscellaneous Files
SQLQuery10.sql
SQLQuery9.sql

```
USE [moviescope]
GO

/****** Object:  Table [dbo].[User_Login]
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[User_Login](
    [Uid] [int] IDENTITY(1,1) NOT NULL,
    [Uname] [nvarchar](50) NULL,
    [password] [varchar](50) NULL,
    [isAdmin] [bit] NULL
) ON [PRIMARY]
GO
```

40. The SQL query executes successfully; observe that the **Commands completed successfully** message appears in the lower section of the window.
41. Close the current tab.
42. The **Microsoft SQL Server Management Studio** notification appears; click **No**.
43. Close **Solution Explorer** in the right-hand pane.
44. Now, right-click the **dbo.tb1Contact** table from the left-hand pane, and from the context menu, click **Edit Top 200 Rows**.


SQL Server Scripts2 - Microsoft SQL Server Manag...
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect
FileTables
External Tables
Graph Tables
dbo.Comments
dbo.CustomerL
dbo.Movie_Det
dbo.Offices
dbo.OrderDetai
dbo.OrderDetai
dbo.Orders
dbo.Orders1
dbo.sqlmapout
dbo.tblContact
dbo.User_Login
dbo.User_Profil
Table...
Design
Select Top 1000 Rows
Edit Top 200 Rows
Script Table as
View Dependencies
Memory Optimization Advisor
Encrypt Columns...
Full-Text index
Storage

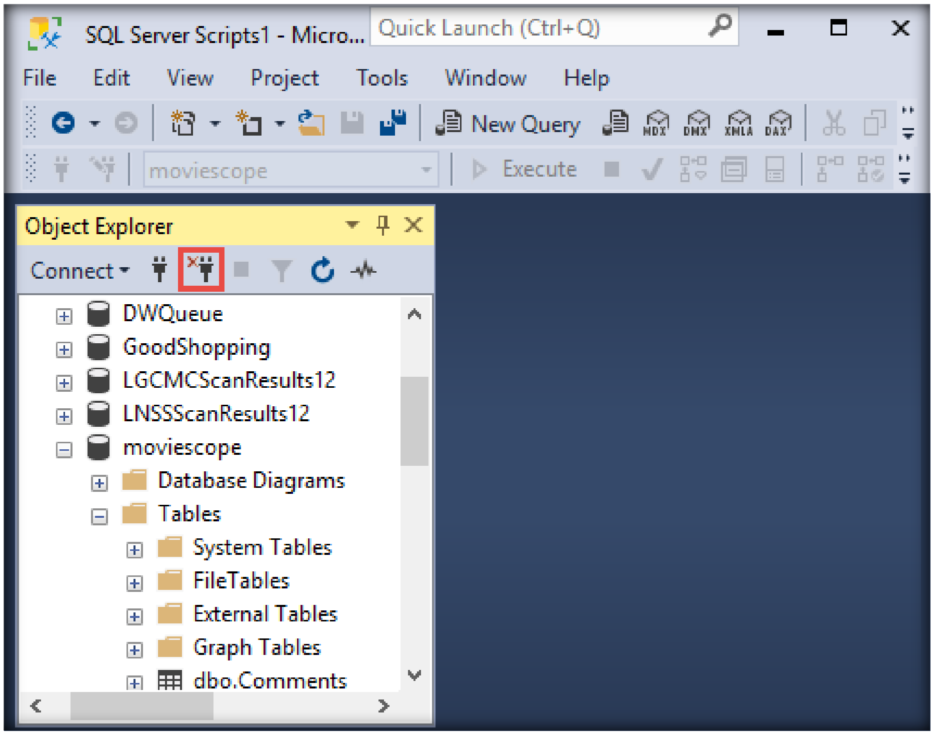
45. A new tab appears, displaying the content of **dbo.tb1Contact**. Delete the content in the first row.


SQL Server Scripts3 - Microsoft SQL Server Man...
Quick Launch (Ctrl+Q)
File Edit View Project Query Designer Tools Window Help
New Query
moviescope
Execute
Object Explorer
Connect
External Tables
Graph Tables
dbo.Comments
dbo.CustomerLogin
dbo.Movie_Details
dbo.Offices
dbo.OrderDetails
dbo.OrderDetails1
dbo.Orders
dbo.Orders1
dbo.sqlmapoutput
dbo.tblContact
dbo.User_Login
dbo.User_Profile
SERVER2019\SQLEXP...e - dbo.tblContact
1 of 1

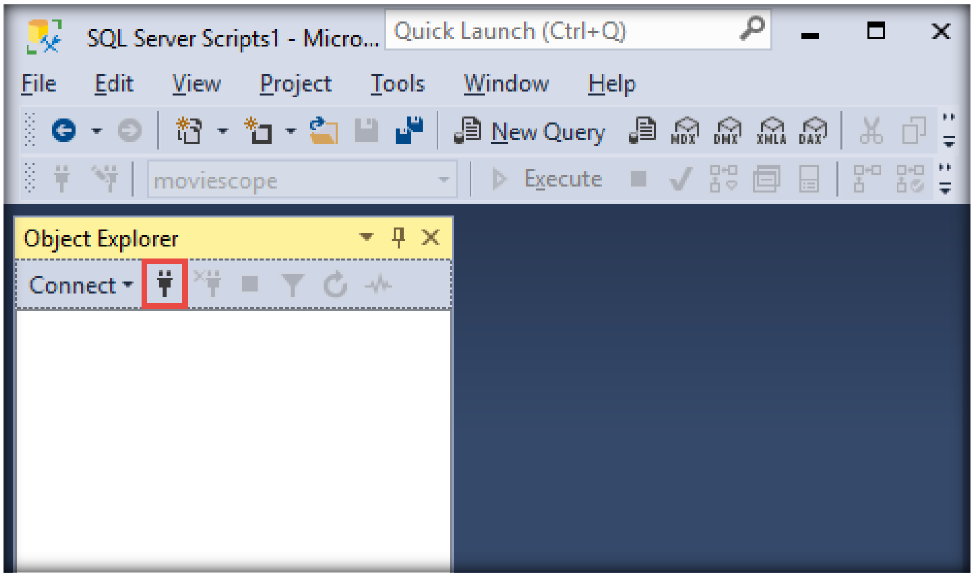
| Contact_id | Contact_name | Contact_msg |
|---|---|---|
| 1 | | |
| NULL | NULL | NULL |

46. Close the current tab.

47. Click the **Disconnect** icon () under the **Object Explorer** section in the left-hand pane.

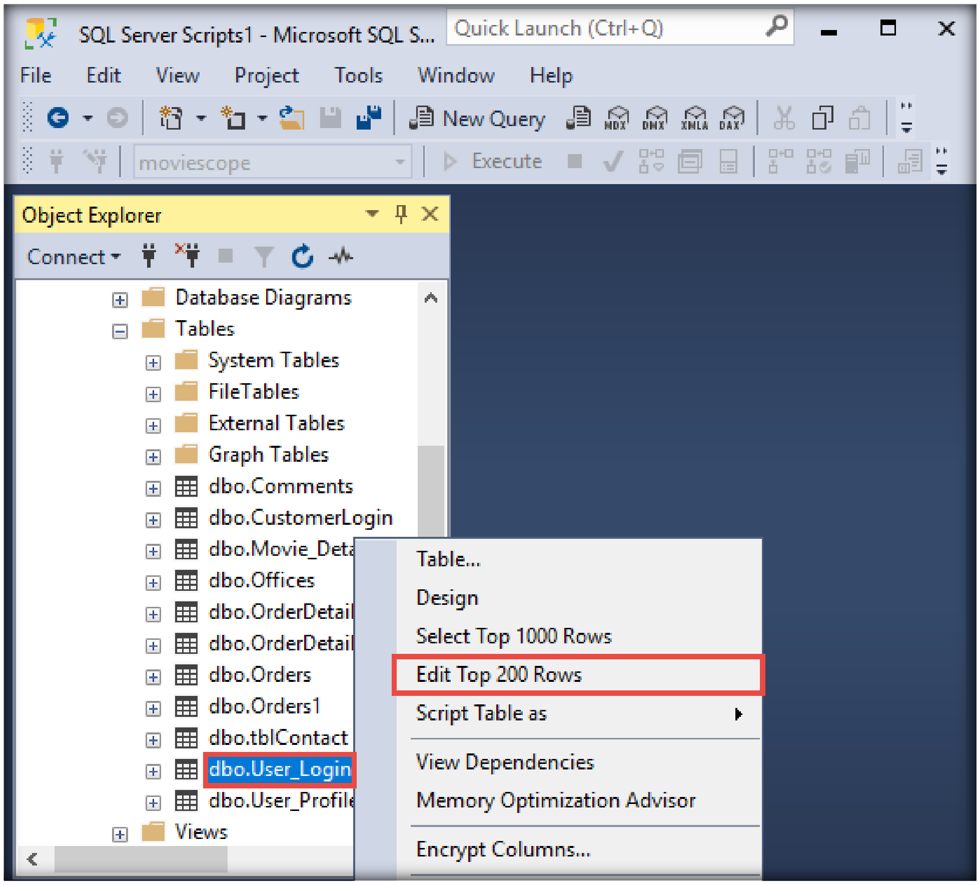

SQL Server Scripts1 - Micro...
Quick Launch (Ctrl+Q)
File Edit View Project Tools Window Help
New Query
moviescope
Execute
Object Explorer
Connect
DWQueue
GoodShopping
LGCMCScanResults12
LNSSScanResults12
moviescope
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
dbo.Comments

48. After the server disconnects, click the **Connect Object Explorer** (🔌) icon under the **Object Explorer** section in the left-hand pane.

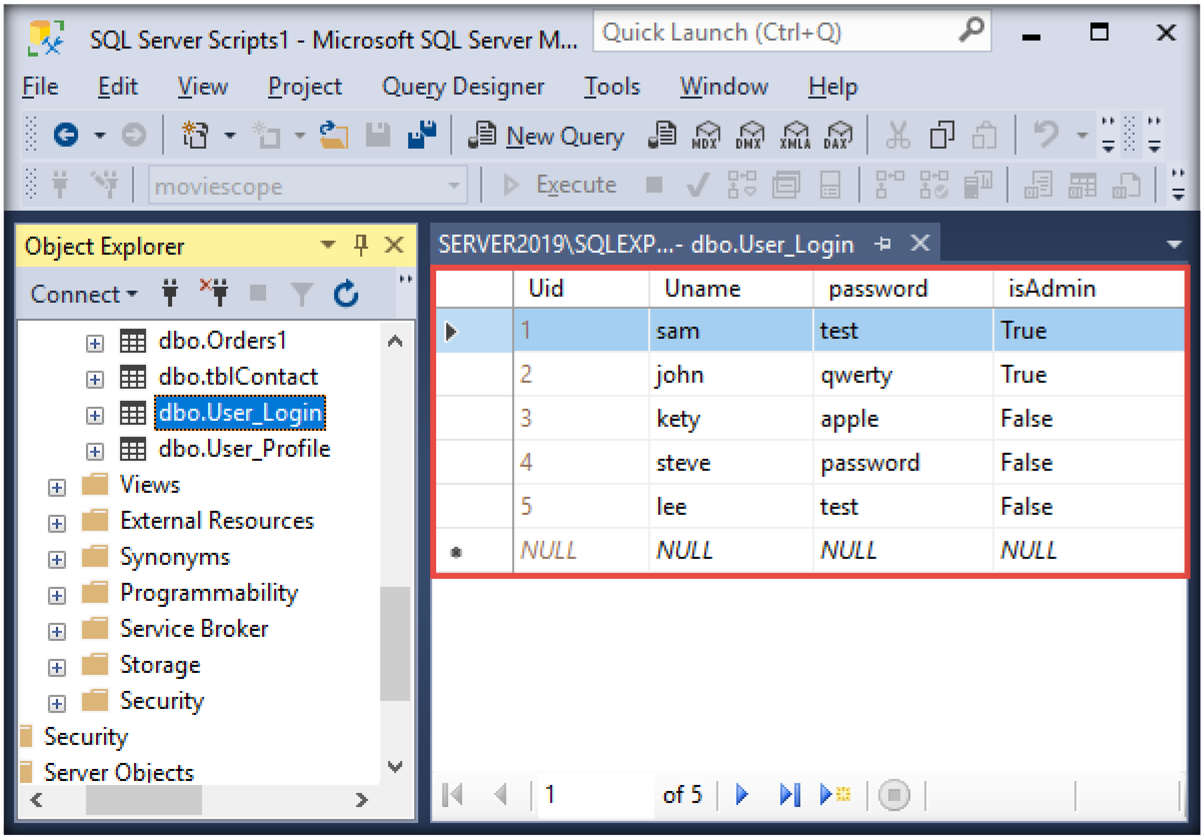

SQL Server Scripts1 - Micro...
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect

49. The **Connect to Server** window appears; click the **Connect** button.

50. From the left-hand pane, expand the **Databases** node and navigate to **moviescope → Tables**. Right-click the **dbo.User_Login** table and select **Edit Top 200 Rows**.


SQL Server Scripts1 - Microsoft SQL S...
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
dbo.Comments
dbo.CustomerLogin
dbo.Movie_Deta
dbo.Offices
dbo.OrderDetail
dbo.OrderDetail
dbo.Orders
dbo.Orders1
dbo.tblContact
dbo.User_Login
dbo.User_Profile
Views
Table...
Design
Select Top 1000 Rows
Edit Top 200 Rows
Script Table as
View Dependencies
Memory Optimization Advisor
Encrypt Columns...

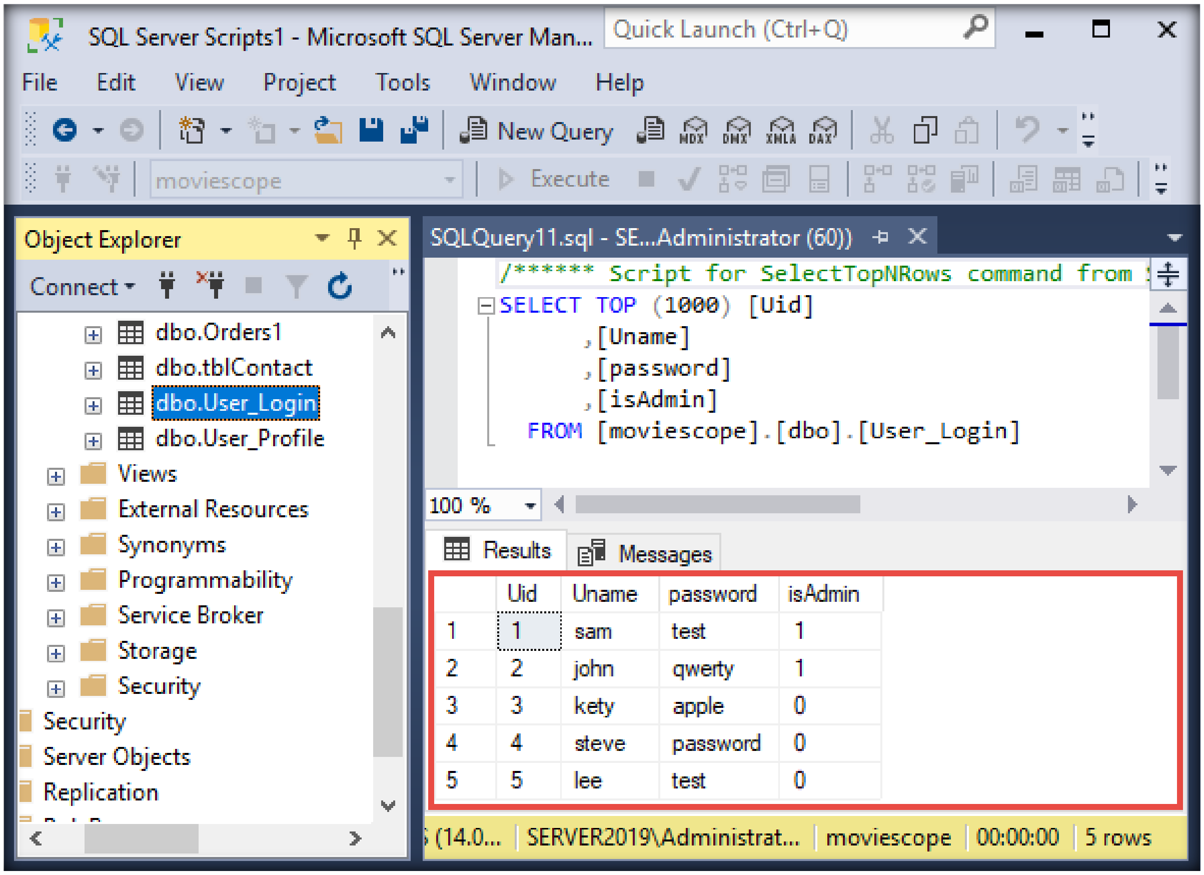
51. The **Edit the dbo.User_Login table** tab appears. Enter **Uname** by using the information from **Step 31**. Enter the passwords for the users under the **password** column, as shown in the screenshot. In the **isAdmin** column, you can assign admin privileges to the users. Here, we are assigning admin privileges to the users **sam** and **john**.


SQL Server Scripts1 - Microsoft SQL Server M...
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Query Designer
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect
dbo.Orders1
dbo.tblContact
dbo.User_Login
dbo.User_Profile
Views
External Resources
Synonyms
Programmability
Service Broker
Storage
Security
Security
Server Objects
SERVER2019\SQLEXP...- dbo.User_Login
1
of 5

| Uid | Uname | password | isAdmin |
|---|---|---|---|
| 1 | sam | test | True |
| 2 | john | qwerty | True |
| 3 | kety | apple | False |
| 4 | steve | password | False |
| 5 | lee | test | False |
| NULL | NULL | NULL | NULL |

52. Close the tab, right-click **dbo.User_Login** from the left-hand pane, and click the **Select Top 1000 Rows** option from the context menu.

53. Observe that the table content appears under the **Results** tab in the lower section of the window, as shown in the screenshot.


SQL Server Scripts1 - Microsoft SQL Server Man...
Quick Launch (Ctrl+Q)
File
Edit
View
Project
Tools
Window
Help
New Query
moviescope
Execute
Object Explorer
Connect
dbo.Orders1
dbo.tblContact
dbo.User_Login
dbo.User_Profile
Views
External Resources
Synonyms
Programmability
Service Broker
Storage
Security
Security
Server Objects
Replication
SQLQuery11.sql - SE...Administrator (60))
100 %
Results
Messages
(14.0...
SERVER2019\Administrat...
moviescope
00:00:00
5 rows

```
/****** Script for SelectTopNRows command from
SELECT TOP (1000) [Uid]
      ,[Uname]
      ,[password]
      ,[isAdmin]
  FROM [moviescope].[dbo].[User_Login]
```

| | Uid | Uname | password | isAdmin |
|---|---|---|---|---|
| 1 | 1 | sam | test | 1 |
| 2 | 2 | john | qwerty | 1 |
| 3 | 3 | kety | apple | 0 |
| 4 | 4 | steve | password | 0 |
| 5 | 5 | lee | test | 0 |

54. Close the current tab and the **Microsoft SQL Server Management Studio** window.

55. If a **Save changes to the following items?** wizard appears, click **No**.

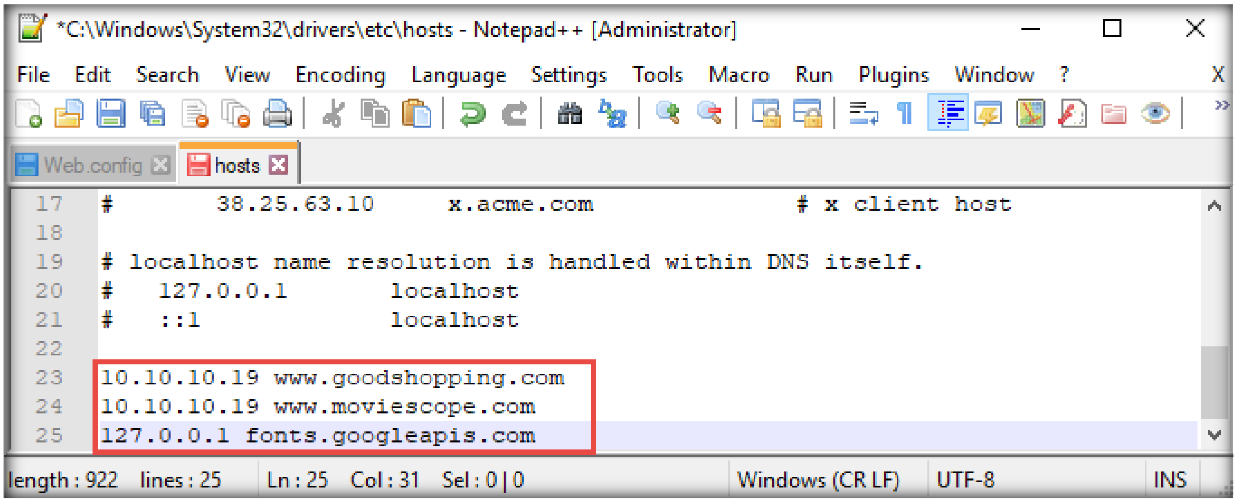
[Back to Configuration Task Outline]

# CT#38: Configure the Hosts File on all Virtual Machines

## Configuring the Hosts File on the Windows Server 2019 and Windows Server 2016 Virtual Machines

1. In **Windows Server 2019**, navigate to **C:\Windows\System32\drivers\etc**, right-click on the **hosts** file, and click **Edit with Notepad++** from the context menu.
2. The hosts file opens in Notepad++. Type <**IP Address of the Windows Server 2019**> **www.goodshopping.com**, <**IP Address of the Windows Server 2019**> **www.moviescope.com**, and **127.0.0.1 fonts.googleapis.com**; then, click the **Save** button and close the **Notepad++** window.

   **Note**: Start typing from **Line#23** onward.


*C:\Windows\System32\drivers\etc\hosts - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
Web.config
hosts
length : 922 lines : 25 Ln : 25 Col : 31 Sel : 0 | 0 Windows (CR LF) UTF-8 INS

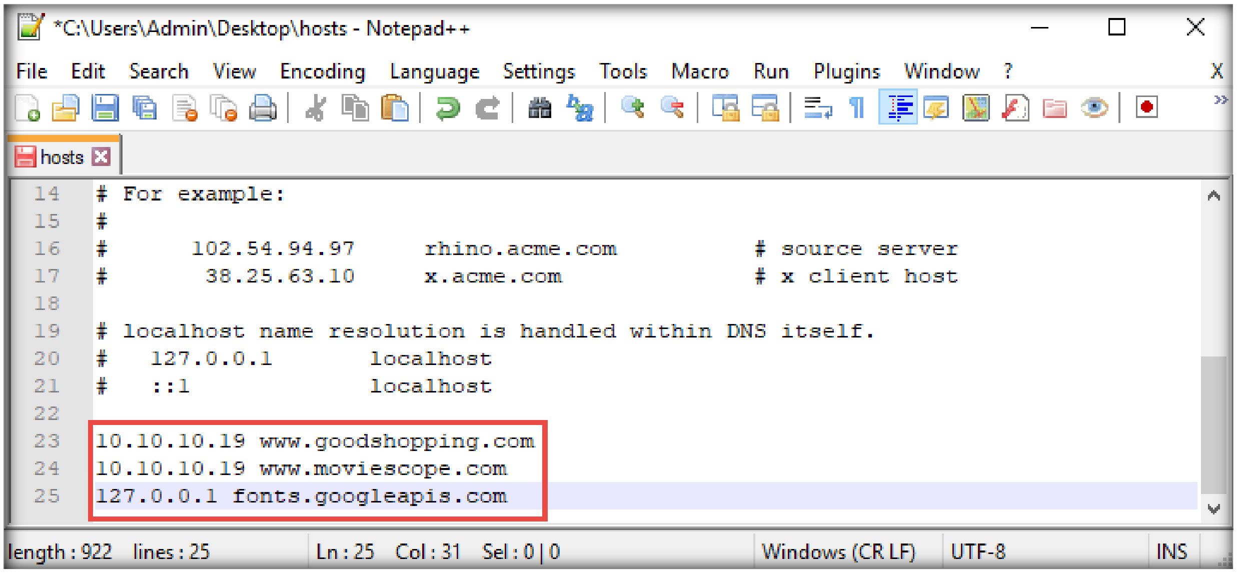
```
#       38.25.63.10     x.acme.com              # x client host

# localhost name resolution is handled within DNS itself.
#   127.0.0.1       localhost
#   ::1             localhost

10.10.10.19 www.goodshopping.com
10.10.10.19 www.moviescope.com
127.0.0.1 fonts.googleapis.com
```

3. Similarly, follow the above two steps to configure the hosts file in **Windows Server 2016**

## Configuring the Hosts File on the Windows 10 Virtual Machine

1. On the **Windows 10** virtual machine, navigate to **C:\Windows\System32\drivers\etc** and copy the hosts file to **Desktop.** Right-click on the **hosts** file and click **Edit with Notepad++** from context menu.

2. The hosts file opens in Notepad++. Type <**IP Address of the Windows Server 2019**> **www.goodshopping.com**, <**IP Address of the Windows Server 2019**> **www.moviescope.com**, and **127.0.0.1 fonts.googleapis.com**; then, click the **Save** button and close the **Notepad++** window.


*C:\Users\Admin\Desktop\hosts - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
hosts
length : 922 lines : 25
Ln : 25 Col : 31 Sel : 0 | 0
Windows (CR LF)
UTF-8
INS

```
# For example:
#
#      102.54.94.97     rhino.acme.com          # source server
#       38.25.63.10     x.acme.com              # x client host

# localhost name resolution is handled within DNS itself.
#   127.0.0.1       localhost
#   ::1             localhost

10.10.10.19 www.goodshopping.com
10.10.10.19 www.moviescope.com
127.0.0.1 fonts.googleapis.com
```

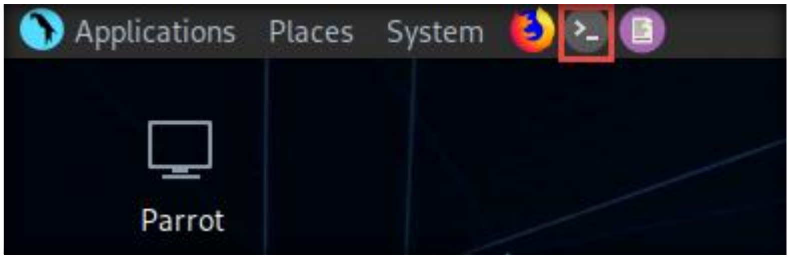
3. Copy this edited **hosts** file and paste it in the following location: **C:\Windows\System32\drivers\etc**

   Note: Here, you need to replace the **hosts** file at the **C:\Windows\System32\drivers\etc** location.

   Note: If a **Destination Folder Access Denied** notification appears, click **Continue**.

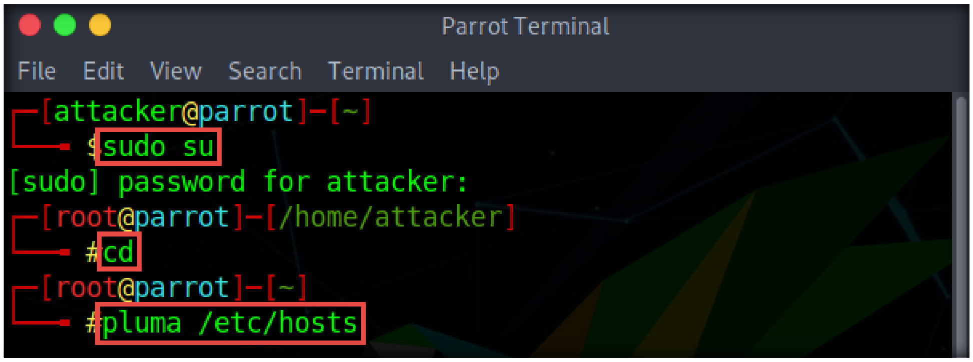
## Configuring Hosts File on the Parrot Security Virtual Machine

1. Launch and log in to the **Parrot Security** virtual machine. The **attacker** username will be selected by default on the login screen. Enter password as **toor** in the **Password** field and press **Enter** to log in to the machine.
2. Click the **MATE Terminal** icon at the top of the **Desktop** window to open a **Terminal** window.



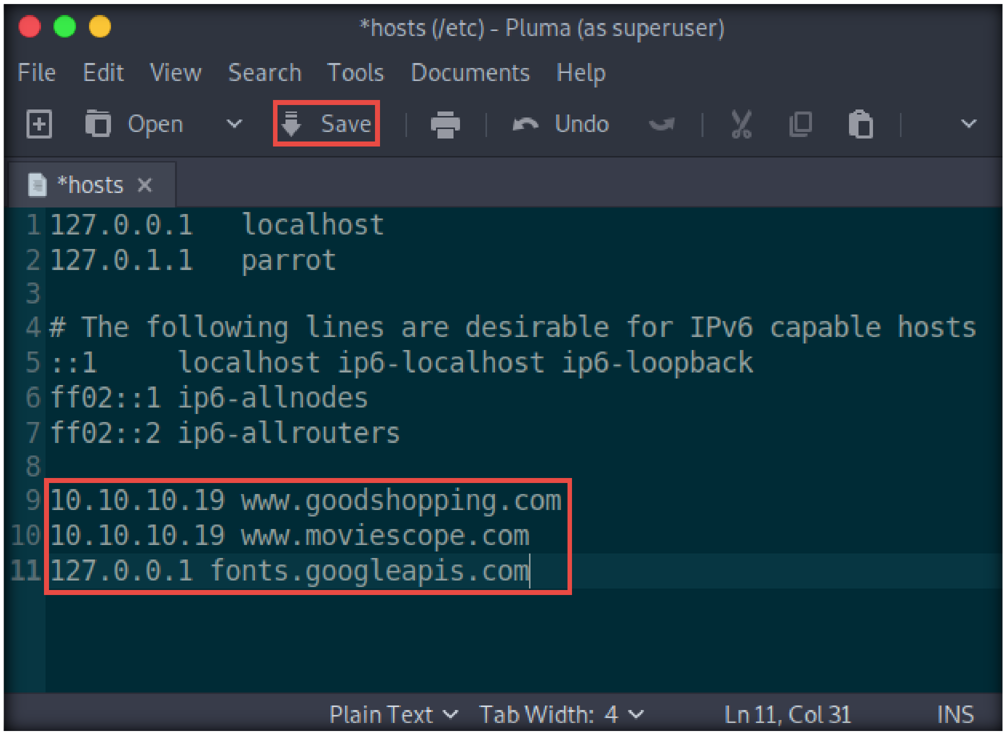
3. A **Terminal** window appears, type **sudo su** and press **Enter**. In the **[sudo] password for attacker** field, type **toor** and press **Enter**.

   **Note**: The entered password will not be visible to you.
4. Now, type **cd** and press **Enter** to change the directory to home.
5. Type **pluma /etc/hosts** and press **Enter**, to open the hosts file in the text editor.



```
┌─[attacker@parrot]─[~]
└──╼ $sudo su
[sudo] password for attacker:
┌─[root@parrot]─[/home/attacker]
└──╼ #cd
┌─[root@parrot]─[~]
└──╼ #pluma /etc/hosts
```

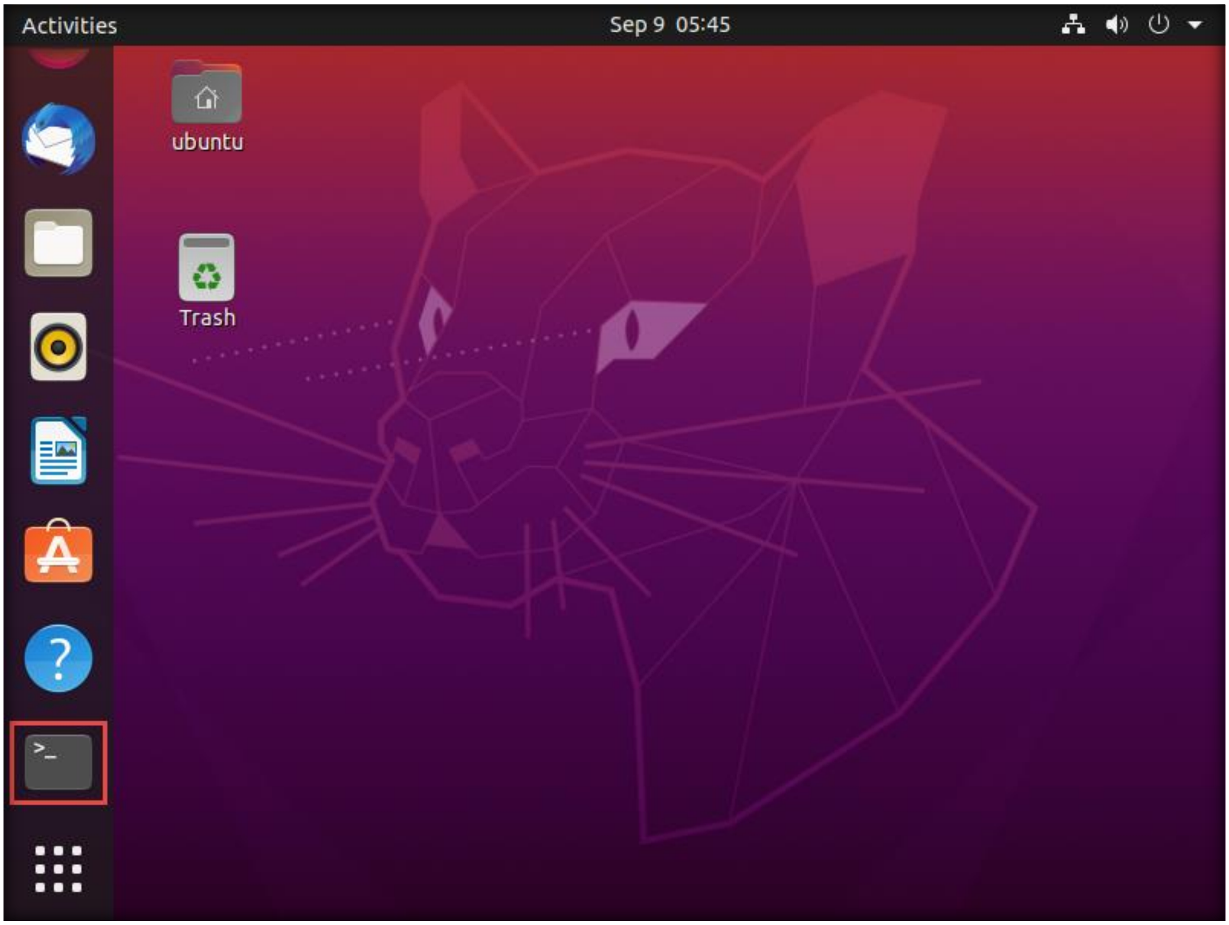
6. The hosts file opens in a text editor window; type <**IP Address of the Windows Server 2019**> **www.goodshopping.com**, <**IP Address of the Windows Server 2019**> **www.moviescope.com**, and **127.0.0.1 fonts.googleapis.com**; then, click **Save** button and close the window.


*hosts (/etc) - Pluma (as superuser)
File Edit View Search Tools Documents Help
Open
Save
Undo
*hosts
Plain Text
Tab Width: 4
Ln 11, Col 31
INS

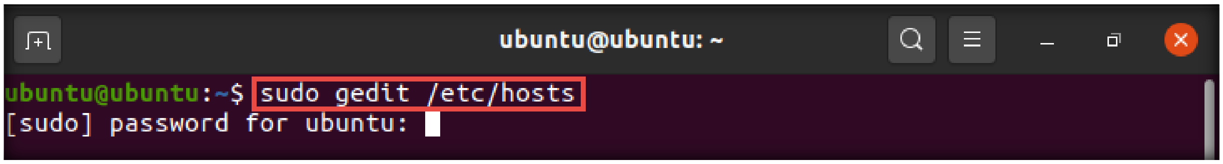
```
127.0.0.1	localhost
127.0.1.1	parrot

# The following lines are desirable for IPv6 capable hosts
::1     localhost ip6-localhost ip6-loopback
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters

10.10.10.19 www.goodshopping.com
10.10.10.19 www.moviescope.com
127.0.0.1 fonts.googleapis.com
```

## Configuring the Hosts File in the Ubuntu Virtual Machine

1. Launch and log in to the **Ubuntu** machine; click the terminal icon from the launcher bar to launch.

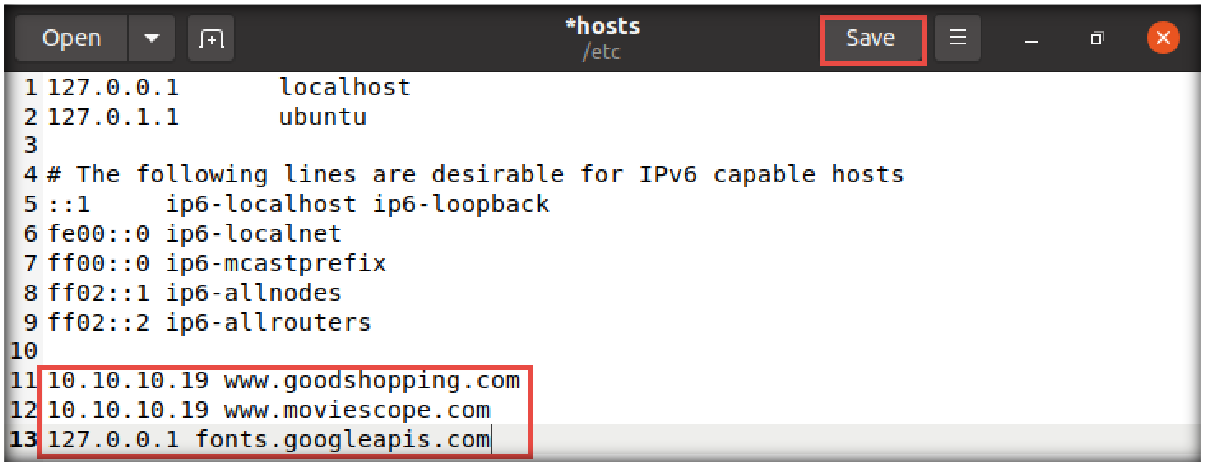

Activities
Sep 9 05:45
ubuntu
Trash

2. Type **sudo gedit /etc/hosts** and press **Enter**. It will prompt you to enter the root password; type **toor** in the password field and press **Enter**.


ubuntu@ubuntu: ~

```
ubuntu@ubuntu:~$ sudo gedit /etc/hosts
[sudo] password for ubuntu: 
```

3. The hosts file opens in the text editor window; type <**IP Address of the Windows Server 2019**> **www.goodshopping.com,** <**IP Address of the Windows Server 2019**> **www.moviescope.com**, and **127.0.0.1 fonts.googleapis.com**; then, click the **Save** button and close the window.



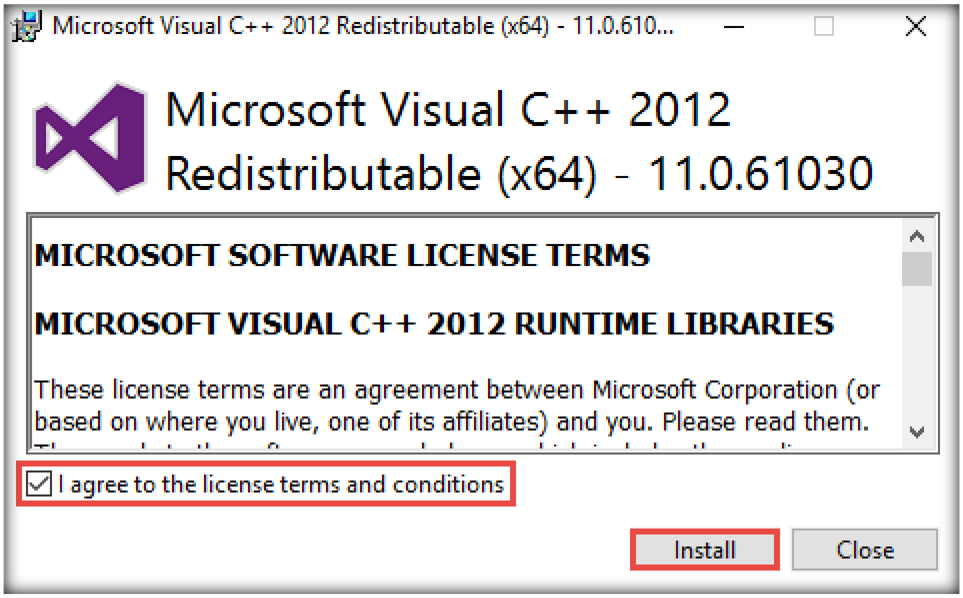
```
127.0.0.1       localhost
127.0.1.1       ubuntu

# The following lines are desirable for IPv6 capable hosts
::1     ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters

10.10.10.19 www.goodshopping.com
10.10.10.19 www.moviescope.com
127.0.0.1 fonts.googleapis.com
```

**Note**: Once you have configured the hosts file on all the machines, turn on the **Windows Server 2019** virtual machine, open any browser, and browse **www.goodshopping.com** and **www.moviescope.com** using each of the virtual machines.

[Back to Configuration Task Outline]

## CT#39: Install WampServer on the Windows Server 2016 Virtual Machine

1. Turn on the **Windows 10** virtual machine.
2. Log in to the **Windows Server 2016** virtual machine using the credentials **Administrator** and **Pa$$w0rd**.
3. To install Wampserver without any errors, you first need to install **Microsoft Visual C++ 2012 Redistribute**.
4. Navigate to **Z:\CEHv11 Lab Prerequisites\Microsoft Visual C++ Packages** and double-click **Visual C++ Redistributable for Visual Studio 2012 Update 4x64.exe**.
5. The **Microsoft Visual C++ 2012 Redistributable (x64)** setup window appears. Accept the license terms, and click **Install**.



Microsoft Visual C++ 2012 Redistributable (x64) - 11.0.610...

Microsoft Visual C++ 2012
Redistributable (x64) - 11.0.61030

MICROSOFT SOFTWARE LICENSE TERMS

MICROSOFT VISUAL C++ 2012 RUNTIME LIBRARIES

These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them.

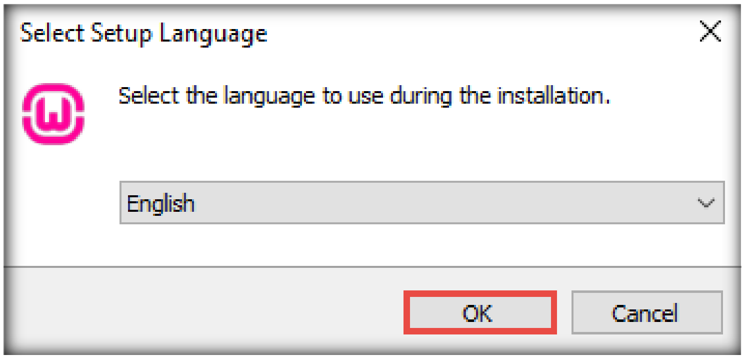
☑ I agree to the license terms and conditions

6. On completion of the installation, click **Close**.
7. In the same way, follow the wizard-driven steps to install the **Microsoft Visual C++ 2008 Redistribute** (**Microsoft Visual C++ 2008 SP1 Redistributable Package (x64).exe**), **Microsoft Visual C++ 2010 Redistribute** (**Microsoft Visual C++ 2010 SP1 Redistributable Package (x64).exe**), **Microsoft Visual C++ 2013 Redistribute** (**Visual C++ Redistributable Packages for Visual Studio 2013x64.exe**), and **Microsoft Visual C++ 2015-2019 Redistribute** (**Microsoft Visual C++ 2015-2019 SP1 Redistributable Package (x64).exe**) packages.

   **Note**: If you are running a x64 bit system, you have to install both the x64 and x86 versions of the packages.

8. Navigate to **Z:\CEHv11 Lab Prerequisites\WampServer** and double-click **wampserver3.1.9_x64.exe**.

9. The **Select Setup Language** window appears; click **OK**.



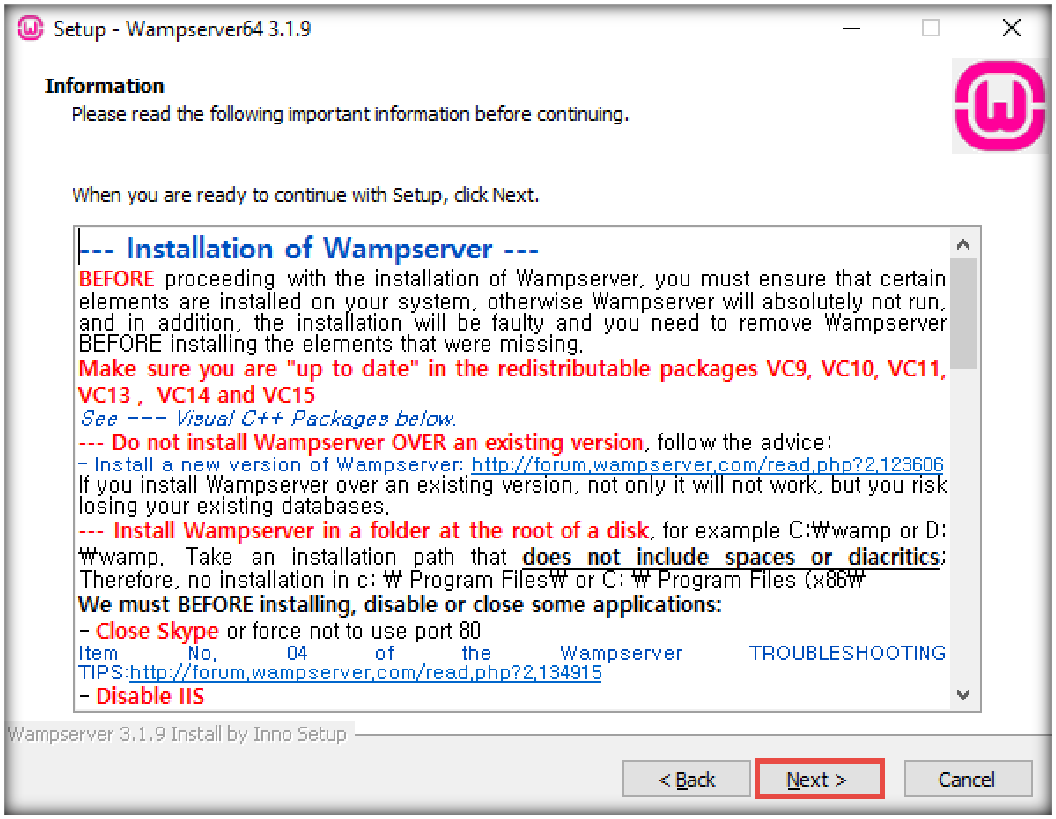
Select Setup Language

Select the language to use during the installation.

English

10. In the **License Agreement** section, accept the license agreement and click **Next**.

11. The **Information** section appears. Make sure you have the redistributable packages mentioned here and click **Next**.



Setup - Wampserver64 3.1.9

**Information**

Please read the following important information before continuing.

When you are ready to continue with Setup, click Next.

--- Installation of Wampserver ---

BEFORE proceeding with the installation of Wampserver, you must ensure that certain elements are installed on your system, otherwise Wampserver will absolutely not run, and in addition, the installation will be faulty and you need to remove Wampserver BEFORE installing the elements that were missing.

**Make sure you are "up to date" in the redistributable packages VC9, VC10, VC11, VC13 , VC14 and VC15**

*See --- Visual C++ Packages below.*

--- Do not install Wampserver OVER an existing version, follow the advice:

- Install a new version of Wampserver: http://forum.wampserver.com/read.php?2,123606

If you install Wampserver over an existing version, not only it will not work, but you risk losing your existing databases.

--- Install Wampserver in a folder at the root of a disk, for example C:₩wamp or D:₩wamp. Take an installation path that **does not include spaces or diacritics**; Therefore, no installation in c: ₩ Program Files₩ or C: ₩ Program Files (x86₩

**We must BEFORE installing, disable or close some applications:**

- Close Skype or force not to use port 80

Item No. 04 of the Wampserver TROUBLESHOOTING TIPS:http://forum.wampserver.com/read.php?2,134915

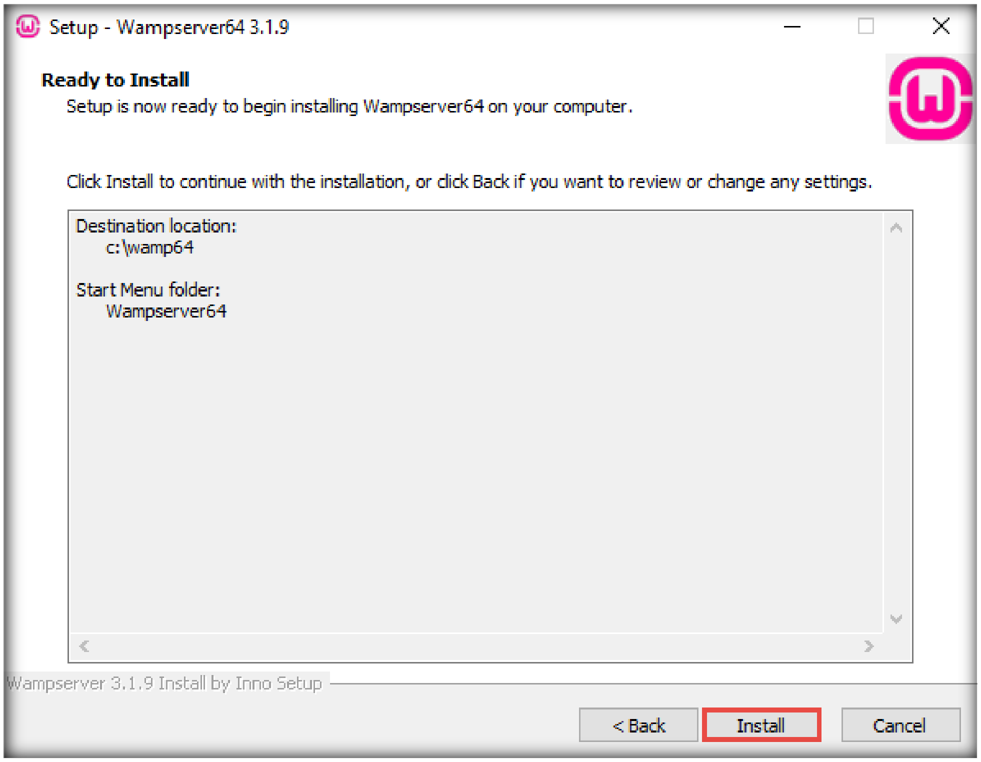
- Disable IIS

Wampserver 3.1.9 Install by Inno Setup

12. The **Select Destination Location** section appears; specify a location where you want to install the server and click **Next**.

13. The **Select Start Menu Folder** section appears; click **Next**.

14. The **Ready to Install** section appears; click **Install**.



Setup - Wampserver64 3.1.9

**Ready to Install**

Setup is now ready to begin installing Wampserver64 on your computer.

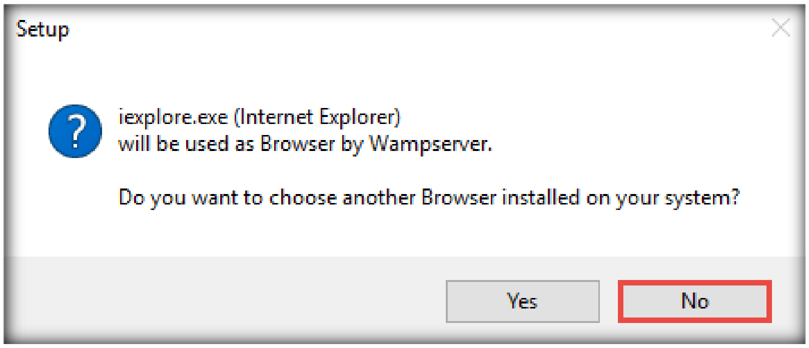
Click Install to continue with the installation, or click Back if you want to review or change any settings.

Destination location:
c:\wamp64

Start Menu folder:
Wampserver64

Wampserver 3.1.9 Install by Inno Setup
< Back
Install
Cancel

15. The **Setup** pop-up appears, asking if you want to choose the browser to be used by Wampserver; click **No.**



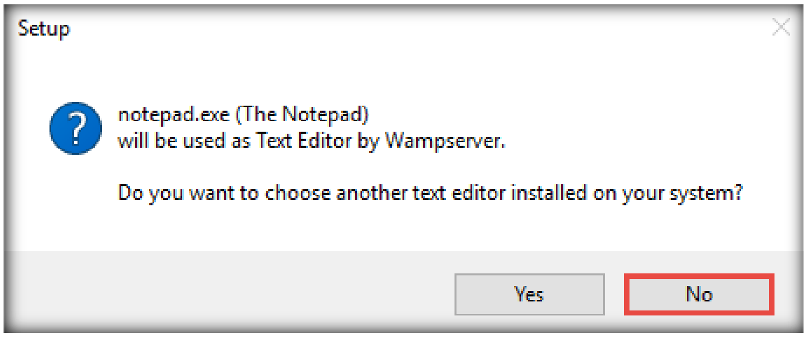
Setup

iexplore.exe (Internet Explorer)
will be used as Browser by Wampserver.

Do you want to choose another Browser installed on your system?

Yes
No

16. Another **Setup** pop-up appears, asking if you want to choose the text editor to be used by Wampserver; click **No**.



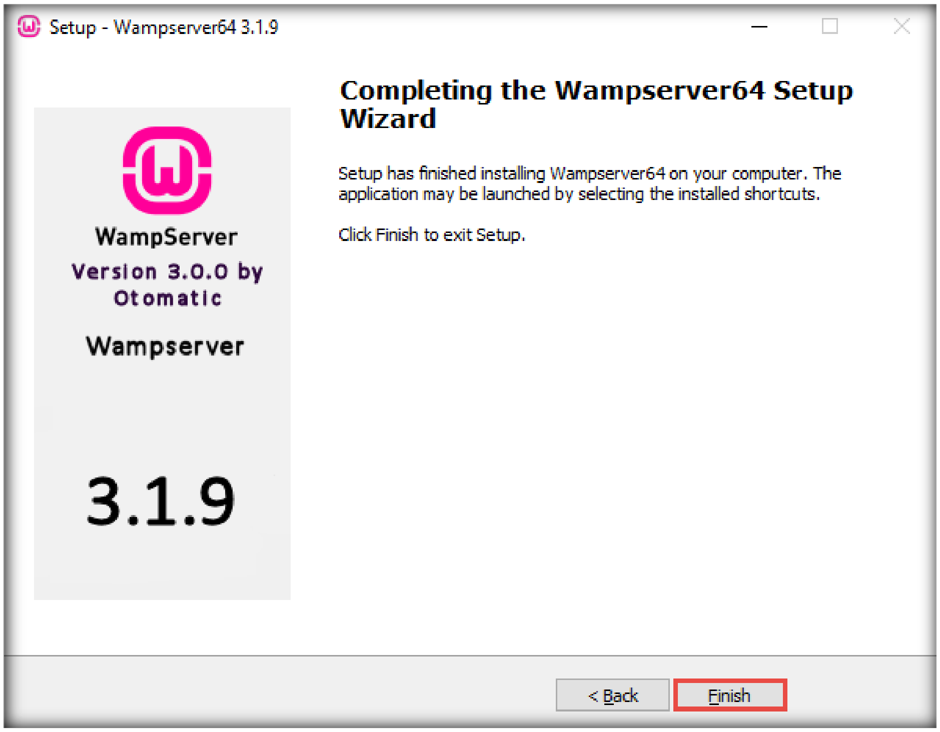
Setup

notepad.exe (The Notepad)
will be used as Text Editor by Wampserver.

Do you want to choose another text editor installed on your system?

Yes
No

17. The **Information** section appears; click **Next**.
18. The **Completing the Wampserver64 Setup Wizard** section appears; click **Finish**.



Setup - Wampserver64 3.1.9
WampServer
Version 3.0.0 by Otomatic
Wampserver
3.1.9
< Back
Finish

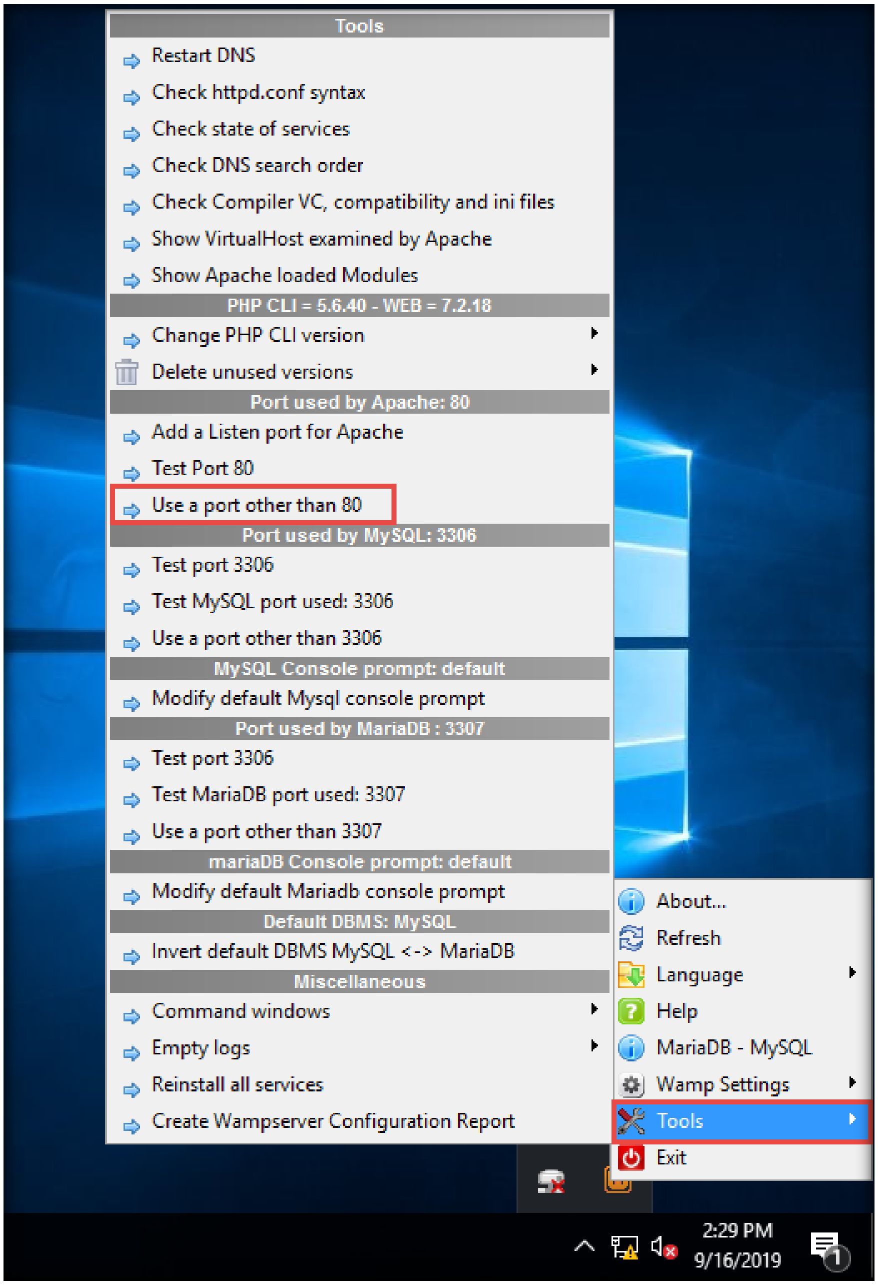
Completing the Wampserver64 Setup Wizard

Setup has finished installing Wampserver64 on your computer. The application may be launched by selecting the installed shortcuts.

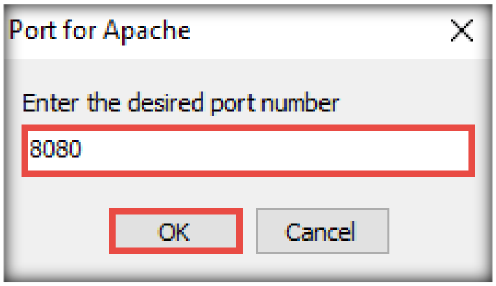
Click Finish to exit Setup.

19. Click the **Windows** icon it the lower-left corner of the screen. The **Start** menu appears; click **Wampserver64**.

20. Right-click the Wampserver icon from the taskbar notification area and go to **Tools → Port used by Apache: 80 → Use a port other than 80**.


Tools
Restart DNS
Check httpd.conf syntax
Check state of services
Check DNS search order
Check Compiler VC, compatibility and ini files
Show VirtualHost examined by Apache
Show Apache loaded Modules
PHP CLI = 5.6.40 - WEB = 7.2.18
Change PHP CLI version
Delete unused versions
Port used by Apache: 80
Add a Listen port for Apache
Test Port 80
Use a port other than 80
Port used by MySQL: 3306
Test port 3306
Test MySQL port used: 3306
Use a port other than 3306
MySQL Console prompt: default
Modify default Mysql console prompt
Port used by MariaDB : 3307
Test port 3306
Test MariaDB port used: 3307
Use a port other than 3307
mariaDB Console prompt: default
Modify default Mariadb console prompt
Default DBMS: MySQL
Invert default DBMS MySQL <-> MariaDB
Miscellaneous
Command windows
Empty logs
Reinstall all services
Create Wampserver Configuration Report
About...
Refresh
Language
Help
MariaDB - MySQL
Wamp Settings
Tools
Exit
2:29 PM
9/16/2019
1

21. **The Port for Apache** window appears. Type **8080** as the new port number and click **OK**.

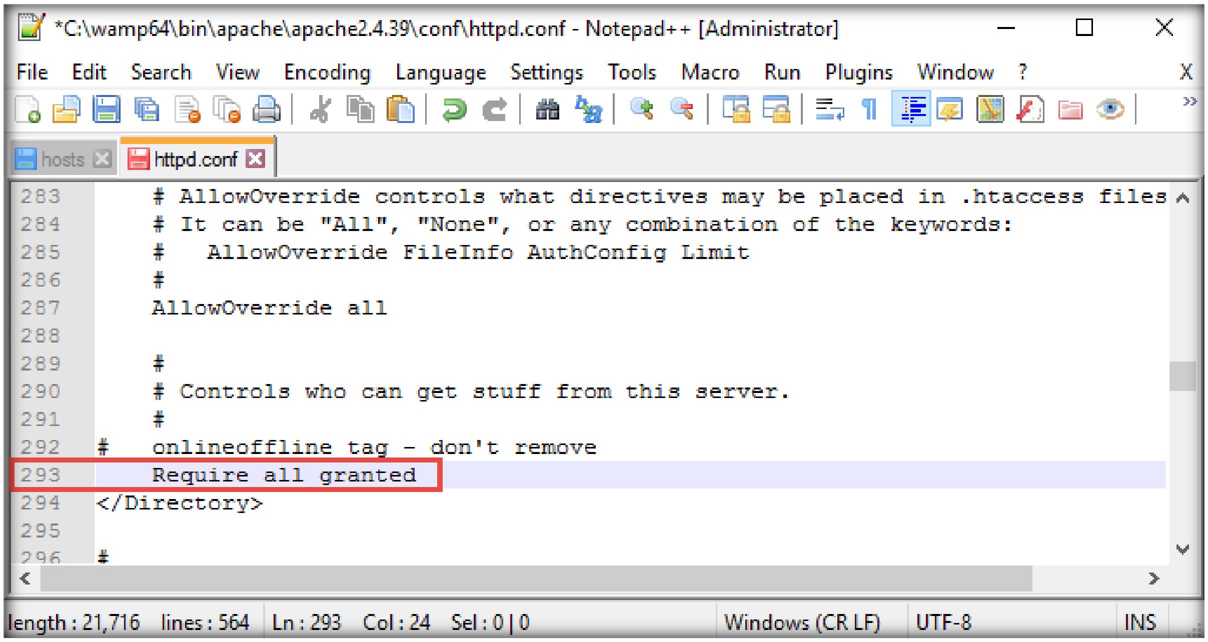

Port for Apache
OK
Cancel

Enter the desired port number

8080

22. Navigate to **C:\wamp64\bin\apache\apache2.4.39\conf** and open the **httpd.conf** file with **Notepad++** (right-click on the **httpd.conf** file and select **Edit with Notepad++**).

23. Scroll down to **line no. 293** and change the script from **Require local** to **Require all granted**.


*C:\wamp64\bin\apache\apache2.4.39\conf\httpd.conf - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
hosts
httpd.conf

```
283     # AllowOverride controls what directives may be placed in .htaccess files
284     # It can be "All", "None", or any combination of the keywords:
285     #   AllowOverride FileInfo AuthConfig Limit
286     #
287     AllowOverride all
288
289     #
290     # Controls who can get stuff from this server.
291     #
292 #   onlineoffline tag - don't remove
293     Require all granted
294 </Directory>
295
296 #
```

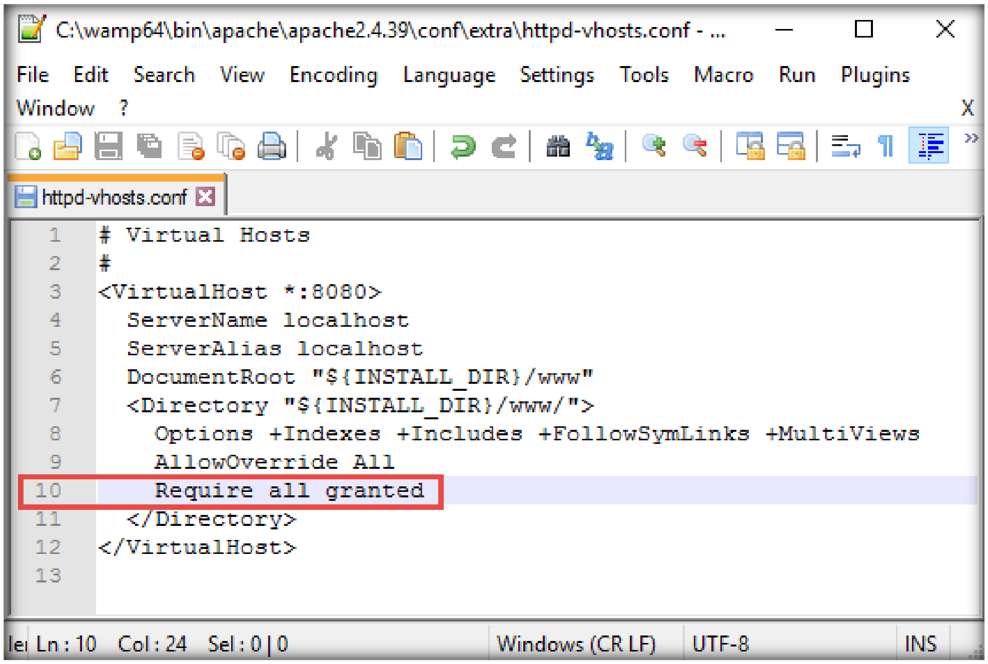
length : 21,716 lines : 564 Ln : 293 Col : 24 Sel : 0 | 0 Windows (CR LF) UTF-8 INS

24. Click **File** from the menu bar, and then click **Save**.

**Note**: You can also press **Ctrl+S** on the keyboard to save the file.

25. Navigate to **C:\wamp64\bin\apache\apache2.4.39\conf\extra** and open the **httpd-vhosts.conf** file with **Notepad++** (right-click on the **httpd-vhosts.conf** file and select **Edit with Notepad++**).

26. On **line no. 10**, change the script from **Require local** to **Require all granted**.


C:\wamp64\bin\apache\apache2.4.39\conf\extra\httpd-vhosts.conf - ...
File Edit Search View Encoding Language Settings Tools Macro Run Plugins
Window ?
httpd-vhosts.conf

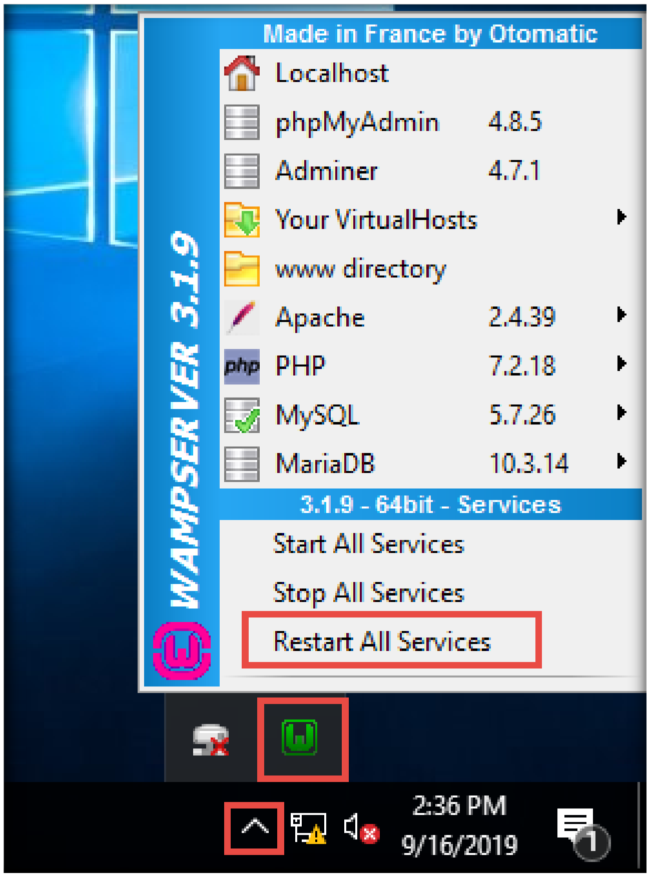
```
 1  # Virtual Hosts
 2  #
 3  <VirtualHost *:8080>
 4    ServerName localhost
 5    ServerAlias localhost
 6    DocumentRoot "${INSTALL_DIR}/www"
 7    <Directory "${INSTALL_DIR}/www/">
 8      Options +Indexes +Includes +FollowSymLinks +MultiViews
 9      AllowOverride All
10      Require all granted
11    </Directory>
12  </VirtualHost>
13
```

le Ln : 10 Col : 24 Sel : 0 | 0 Windows (CR LF) UTF-8 INS

27. Click **File** from the menu bar, and then click **Save**.

    **Note**: You can also press **Ctrl+S** on the keyboard to save the file.

28. **Close** the file and all the other open folders. Click the **Wampserver** icon from the system tray, and then click **Restart All Services**.


Made in France by Otomatic
Localhost
phpMyAdmin 4.8.5
Adminer 4.7.1
Your VirtualHosts
www directory
Apache 2.4.39
PHP 7.2.18
MySQL 5.7.26
MariaDB 10.3.14
3.1.9 - 64bit - Services
Start All Services
Stop All Services
Restart All Services
WAMPSERVER VER 3.1.9
2:36 PM
9/16/2019

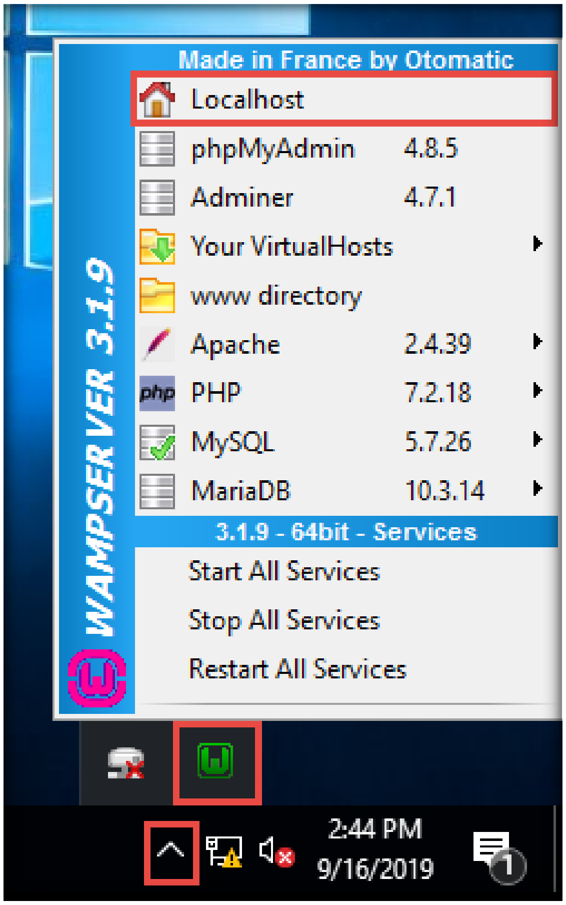
29. Wait until the icon turns green.

[Back to Configuration Task Outline]

# CT#40: Install and Configure the WordPress Website on the Windows Server 2016 Virtual Machine

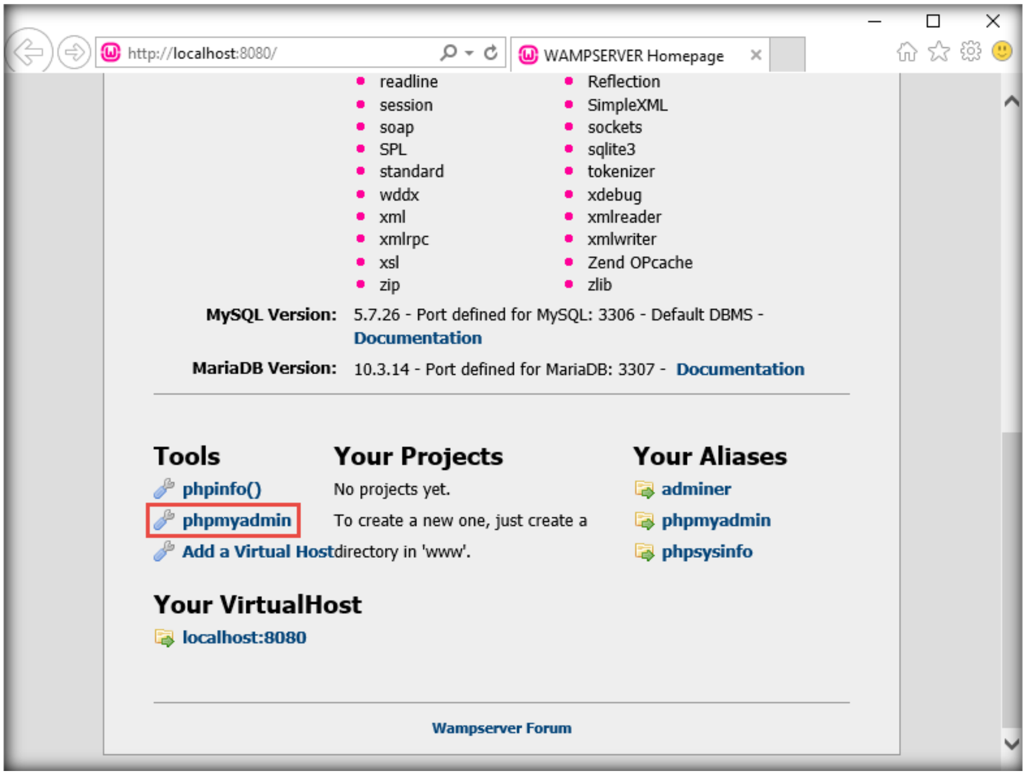
1. On the **Windows Server 2016** virtual machine, click the **WampServer** icon in the notification area and select **Localhost**.

   **Note**: If an **Internet Explorer 11** notification appears, click **Ask me later**.


Made in France by Otomatic
Localhost
phpMyAdmin 4.8.5
Adminer 4.7.1
Your VirtualHosts
www directory
Apache 2.4.39
PHP 7.2.18
MySQL 5.7.26
MariaDB 10.3.14
3.1.9 - 64bit - Services
Start All Services
Stop All Services
Restart All Services
WAMPSERVER VER 3.1.9
2:44 PM
9/16/2019

2. As soon as you click the icon, the WAMPSERVER home page appears in the default browser. Click the **phpmyadmin** link under the **Tools** section.

   **Note**: Screenshots may differ if you are using a different browser.



- readline
- session
- soap
- SPL
- standard
- wddx
- xml
- xmlrpc
- xsl
- zip
- Reflection
- SimpleXML
- sockets
- sqlite3
- tokenizer
- xdebug
- xmlreader
- xmlwriter
- Zend OPcache
- zlib

**MySQL Version:** 5.7.26 - Port defined for MySQL: 3306 - Default DBMS - **Documentation**

**MariaDB Version:** 10.3.14 - Port defined for MariaDB: 3307 - **Documentation**

**Tools**
- phpinfo()
- phpmyadmin
- Add a Virtual Host

**Your Projects**

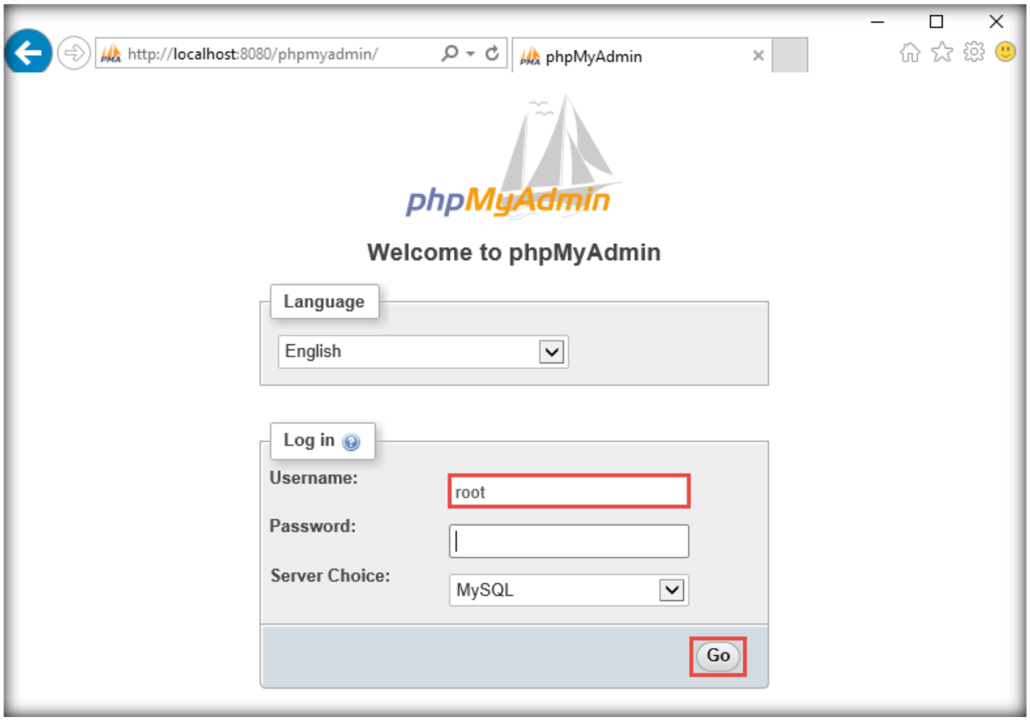
No projects yet.
To create a new one, just create a directory in 'www'.

**Your Aliases**
- adminer
- phpmyadmin
- phpsysinfo

**Your VirtualHost**
- localhost:8080

Wampserver Forum

3. The **phpMyAdmin** login page appears; type **root** as the username and click **Go**.



Welcome to phpMyAdmin

Language

English

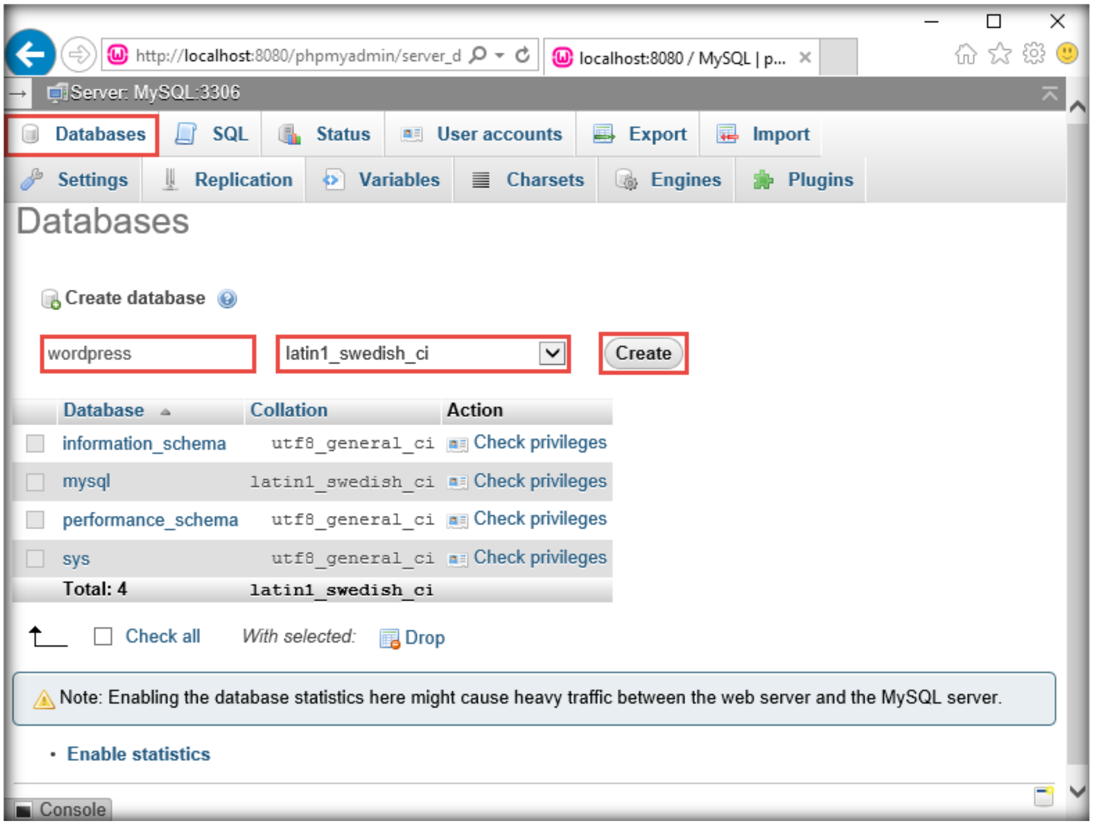
Log in

Username: root

Password:

Server Choice: MySQL

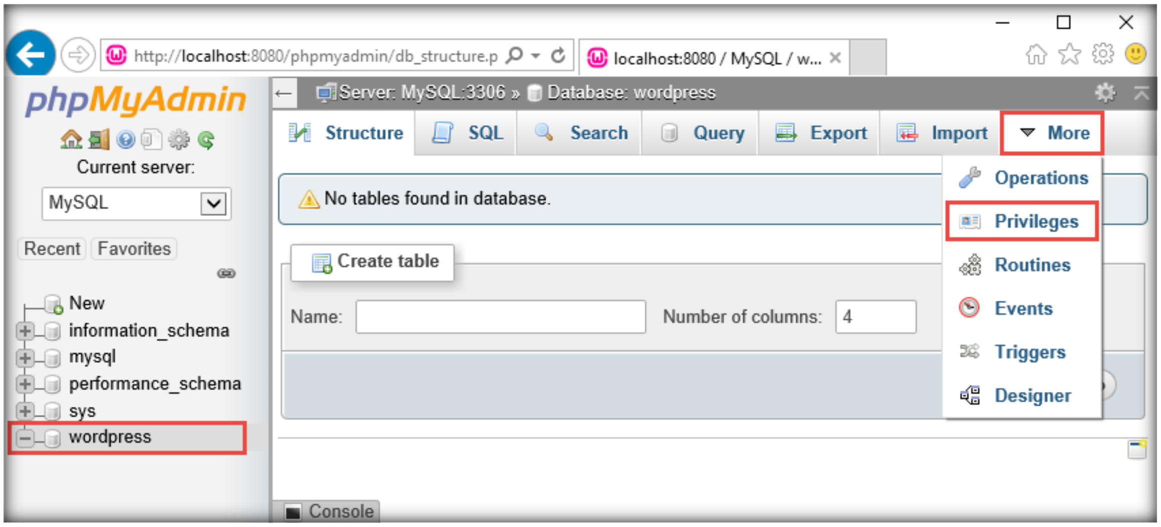
4. The **phpMyAdmin** webpage appears; click the **Databases** tab.
5. The **Databases** webpage appears. Type **wordpress** in the **Create database** text field, leave the drop-down list set to default as **latin1_swedish_ci**, and click **Create** to create a database named wordpress.


http://localhost:8080/phpmyadmin/server_d
localhost:8080 / MySQL | p...
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
Import
Settings
Replication
Variables
Charsets
Engines
Plugins
Databases
Create database
wordpress
latin1_swedish_ci
Create
Check all
With selected:
Drop
Enable statistics
Console

| Database | Collation | Action |
|---|---|---|
| information_schema | utf8_general_ci | Check privileges |
| mysql | latin1_swedish_ci | Check privileges |
| performance_schema | utf8_general_ci | Check privileges |
| sys | utf8_general_ci | Check privileges |
| Total: 4 | latin1_swedish_ci | |

Note: Enabling the database statistics here might cause heavy traffic between the web server and the MySQL server.

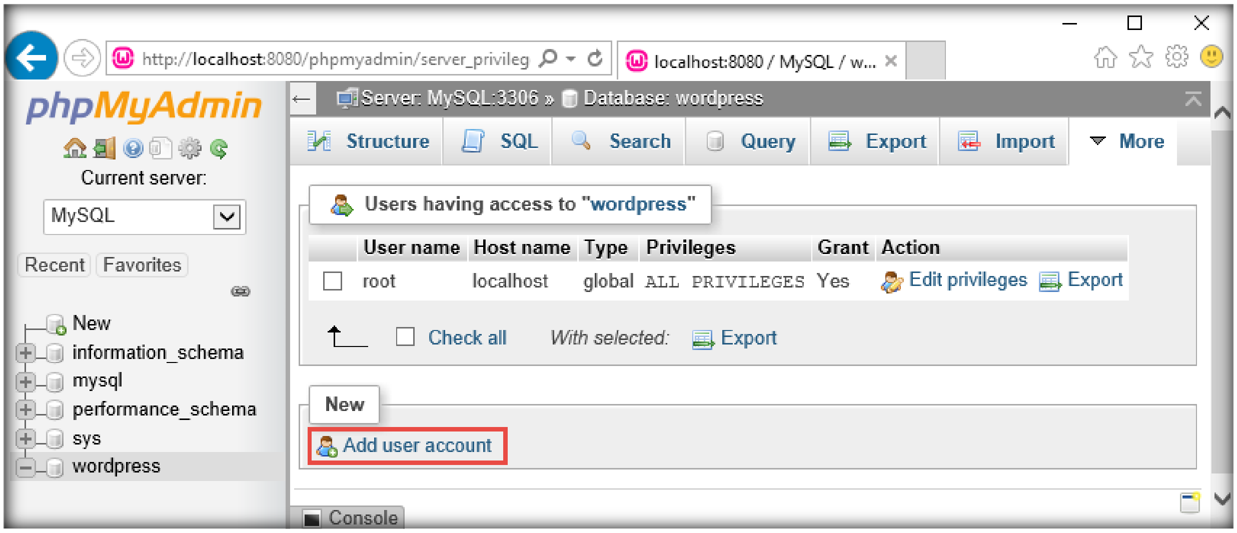
6. On successful creation of the database, a pop-up appears stating that the database has been created.
7. The newly added database appears in the left pane. Click on it.
8. The wordpress database's webpage appears; click **More** → **Privileges**.


http://localhost:8080/phpmyadmin/db_structure.p
localhost:8080 / MySQL / w...
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
information_schema
mysql
performance_schema
sys
wordpress
Server: MySQL:3306 » Database: wordpress
Structure
SQL
Search
Query
Export
Import
More
Operations
Privileges
Routines
Events
Triggers
Designer
Create table
Console

No tables found in database.

Name: Number of columns: 4

9. Here, you will be adding a user to the database. To add, click the **Add user account** link.


http://localhost:8080/phpmyadmin/server_privileg
localhost:8080 / MySQL / w...
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
information_schema
mysql
performance_schema
sys
wordpress
Server: MySQL:3306 » Database: wordpress
Structure
SQL
Search
Query
Export
Import
More
Users having access to "wordpress"
Check all
With selected:
Export
New
Add user account
Console

| User name | Host name | Type | Privileges | Grant | Action |
|---|---|---|---|---|---|
| ☐ root | localhost | global | `ALL PRIVILEGES` | Yes | Edit privileges Export |

10. The **Add user account** page appears.

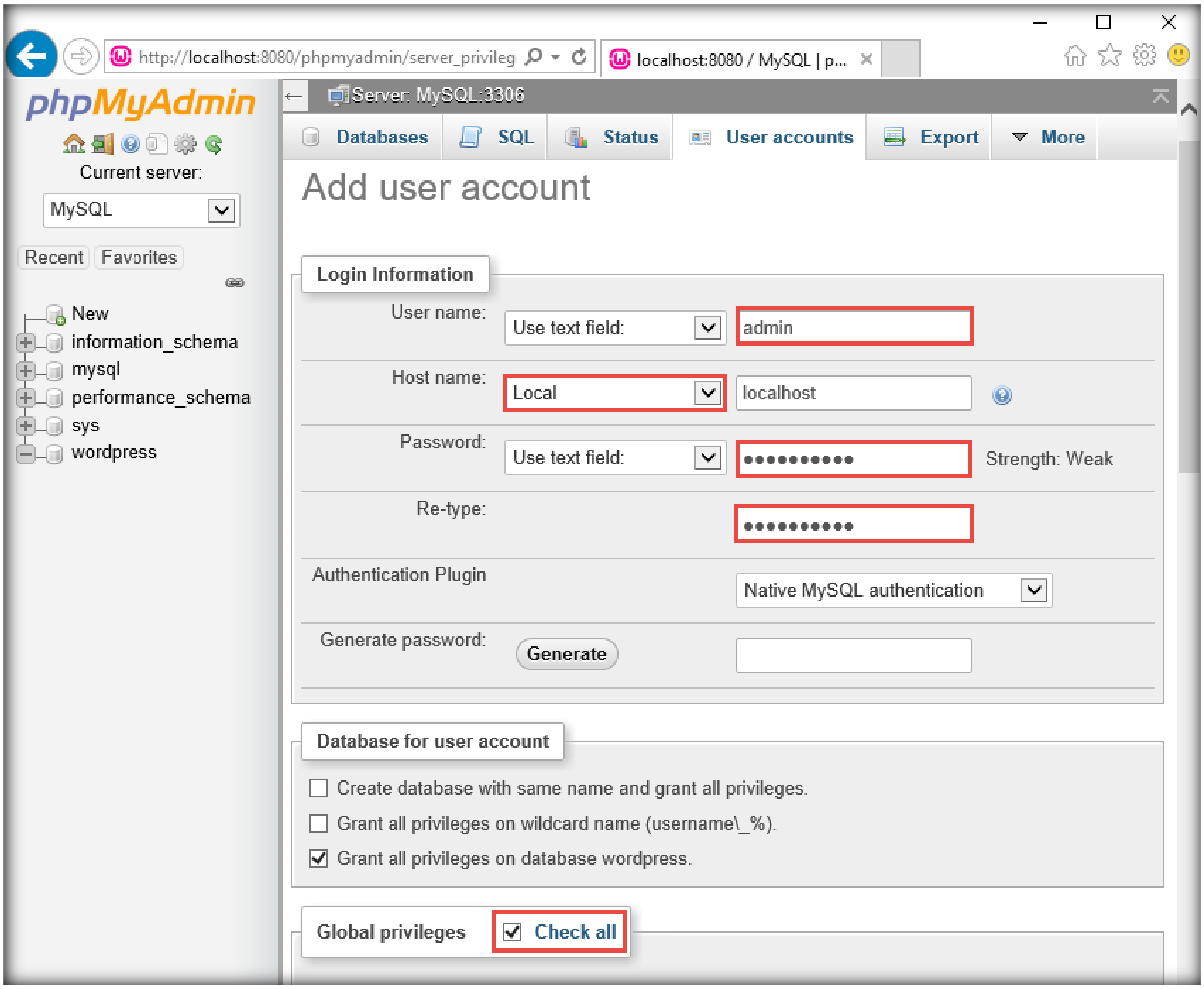
Under **Login Information** section:

- Type **admin** in the **User name** text field
- Select **Local** from the **Host name** drop-down list
- Type the password as **qwerty@123** in the **Password** and **Re-type** password text fields

In the **Global privileges** section:

- Select the **Check all** checkbox

11. Click the **Go** button at the bottom of the page.



http://localhost:8080/phpmyadmin/server_privileg
localhost:8080 / MySQL | p...
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
information_schema
mysql
performance_schema
sys
wordpress
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
More

Add user account

Login Information

User name: Use text field: admin

Host name: Local localhost

Password: Use text field: •••••••••• Strength: Weak

Re-type: ••••••••••

Authentication Plugin: Native MySQL authentication

Generate password: Generate

Database for user account

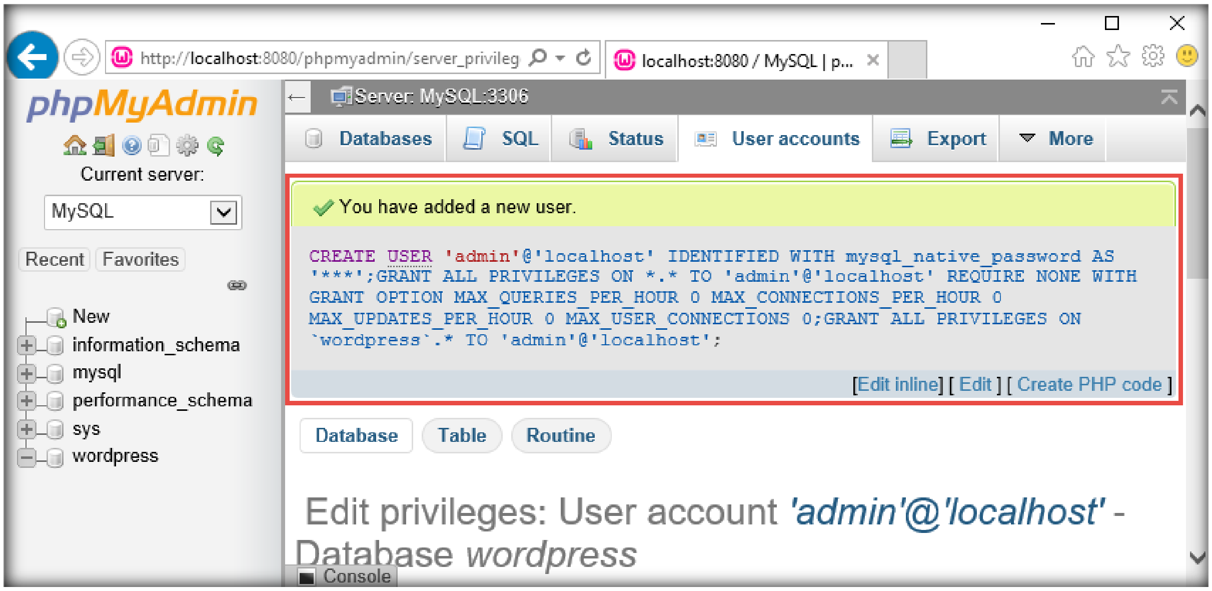
☐ Create database with same name and grant all privileges.

☐ Grant all privileges on wildcard name (username_%).

☑ Grant all privileges on database wordpress.

Global privileges ☑ Check all

12. Observe the newly added user in the wordpress database's webpage, as shown in the screenshot:



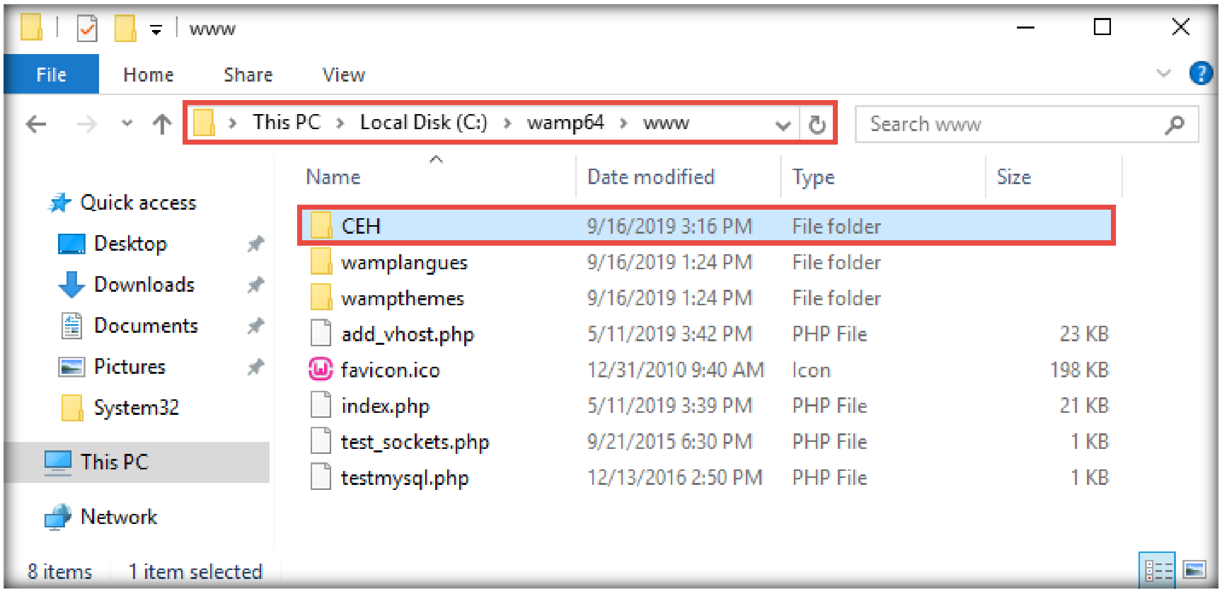
http://localhost:8080/phpmyadmin/server_privileg
localhost:8080 / MySQL | p...
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
information_schema
mysql
performance_schema
sys
wordpress
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
More
[Edit inline] [ Edit ] [ Create PHP code ]
Database
Table
Routine
Console

✓ You have added a new user.

```
CREATE USER 'admin'@'localhost' IDENTIFIED WITH mysql_native_password AS
'***';GRANT ALL PRIVILEGES ON *.* TO 'admin'@'localhost' REQUIRE NONE WITH
GRANT OPTION MAX_QUERIES_PER_HOUR 0 MAX_CONNECTIONS_PER_HOUR 0
MAX_UPDATES_PER_HOUR 0 MAX_USER_CONNECTIONS 0;GRANT ALL PRIVILEGES ON
`wordpress`.* TO 'admin'@'localhost';
```

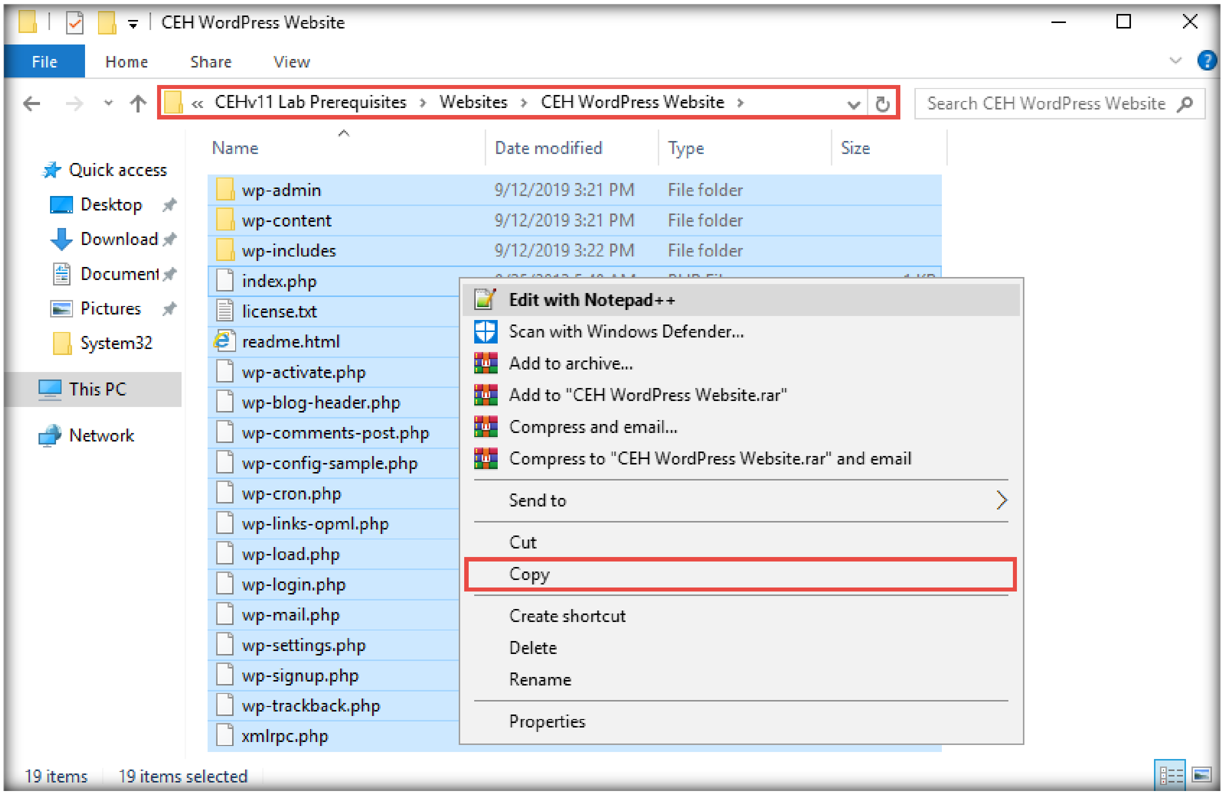
Edit privileges: User account *'admin'@'localhost'* - Database *wordpress*

13. Close the web browser.
14. Navigate to **C:\wamp64\www** and create a new folder named **CEH**.


www
File
Home
Share
View
This PC › Local Disk (C:) › wamp64 › www
Search www
Quick access
Desktop
Downloads
Documents
Pictures
System32
This PC
Network
8 items
1 item selected

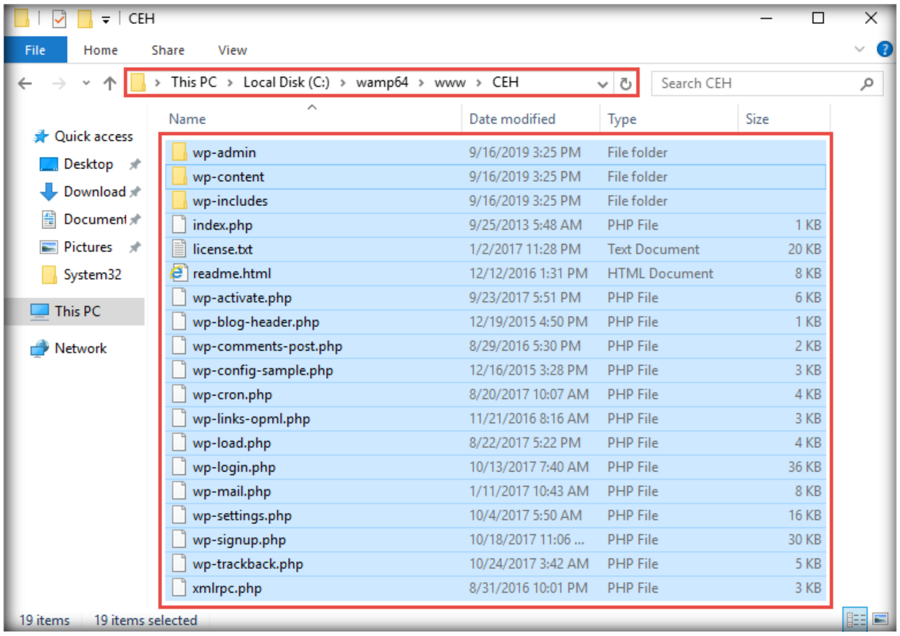
| Name | Date modified | Type | Size |
|---|---|---|---|
| CEH | 9/16/2019 3:16 PM | File folder | |
| wamplangues | 9/16/2019 1:24 PM | File folder | |
| wampthemes | 9/16/2019 1:24 PM | File folder | |
| add_vhost.php | 5/11/2019 3:42 PM | PHP File | 23 KB |
| favicon.ico | 12/31/2010 9:40 AM | Icon | 198 KB |
| index.php | 5/11/2019 3:39 PM | PHP File | 21 KB |
| test_sockets.php | 9/21/2015 6:30 PM | PHP File | 1 KB |
| testmysql.php | 12/13/2016 2:50 PM | PHP File | 1 KB |

15. Navigate to **Z:\CEHv11 Lab Prerequisites\Websites\CEH WordPress Website** and copy all the contents in the location.


CEH WordPress Website
File
Home
Share
View
« CEHv11 Lab Prerequisites › Websites › CEH WordPress Website ›
Search CEH WordPress Website
Quick access
Desktop
Download
Document
Pictures
System32
This PC
Network
Edit with Notepad++
Scan with Windows Defender...
Add to archive...
Add to "CEH WordPress Website.rar"
Compress and email...
Compress to "CEH WordPress Website.rar" and email
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties
19 items
19 items selected

| Name | Date modified | Type | Size |
|---|---|---|---|
| wp-admin | 9/12/2019 3:21 PM | File folder | |
| wp-content | 9/12/2019 3:21 PM | File folder | |
| wp-includes | 9/12/2019 3:22 PM | File folder | |
| index.php | | | |
| license.txt | | | |
| readme.html | | | |
| wp-activate.php | | | |
| wp-blog-header.php | | | |
| wp-comments-post.php | | | |
| wp-config-sample.php | | | |
| wp-cron.php | | | |
| wp-links-opml.php | | | |
| wp-load.php | | | |
| wp-login.php | | | |
| wp-mail.php | | | |
| wp-settings.php | | | |
| wp-signup.php | | | |
| wp-trackback.php | | | |
| xmlrpc.php | | | |

16. Navigate to **C:\wamp64\www\CEH** and paste all the contents copied from **Z:\CEHv11 Lab Prerequisites\Websites\CEH WordPress Website**.

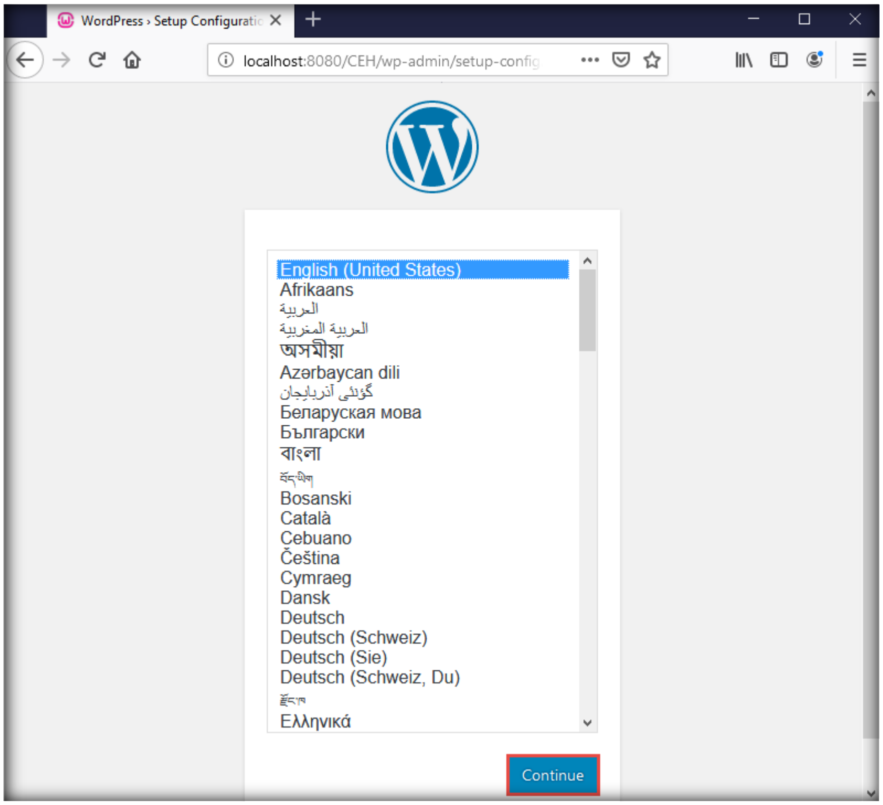

CEH
File
Home
Share
View
This PC › Local Disk (C:) › wamp64 › www › CEH
Search CEH
Quick access
Desktop
Download
Document
Pictures
System32
This PC
Network
19 items
19 items selected

| Name | Date modified | Type | Size |
|---|---|---|---|
| wp-admin | 9/16/2019 3:25 PM | File folder | |
| wp-content | 9/16/2019 3:25 PM | File folder | |
| wp-includes | 9/16/2019 3:25 PM | File folder | |
| index.php | 9/25/2013 5:48 AM | PHP File | 1 KB |
| license.txt | 1/2/2017 11:28 PM | Text Document | 20 KB |
| readme.html | 12/12/2016 1:31 PM | HTML Document | 8 KB |
| wp-activate.php | 9/23/2017 5:51 PM | PHP File | 6 KB |
| wp-blog-header.php | 12/19/2015 4:50 PM | PHP File | 1 KB |
| wp-comments-post.php | 8/29/2016 5:30 PM | PHP File | 2 KB |
| wp-config-sample.php | 12/16/2015 3:28 PM | PHP File | 3 KB |
| wp-cron.php | 8/20/2017 10:07 AM | PHP File | 4 KB |
| wp-links-opml.php | 11/21/2016 8:16 AM | PHP File | 3 KB |
| wp-load.php | 8/22/2017 5:22 PM | PHP File | 4 KB |
| wp-login.php | 10/13/2017 7:40 AM | PHP File | 36 KB |
| wp-mail.php | 1/11/2017 10:43 AM | PHP File | 8 KB |
| wp-settings.php | 10/4/2017 5:50 AM | PHP File | 16 KB |
| wp-signup.php | 10/18/2017 11:06 ... | PHP File | 30 KB |
| wp-trackback.php | 10/24/2017 3:42 AM | PHP File | 5 KB |
| xmlrpc.php | 8/31/2016 10:01 PM | PHP File | 3 KB |

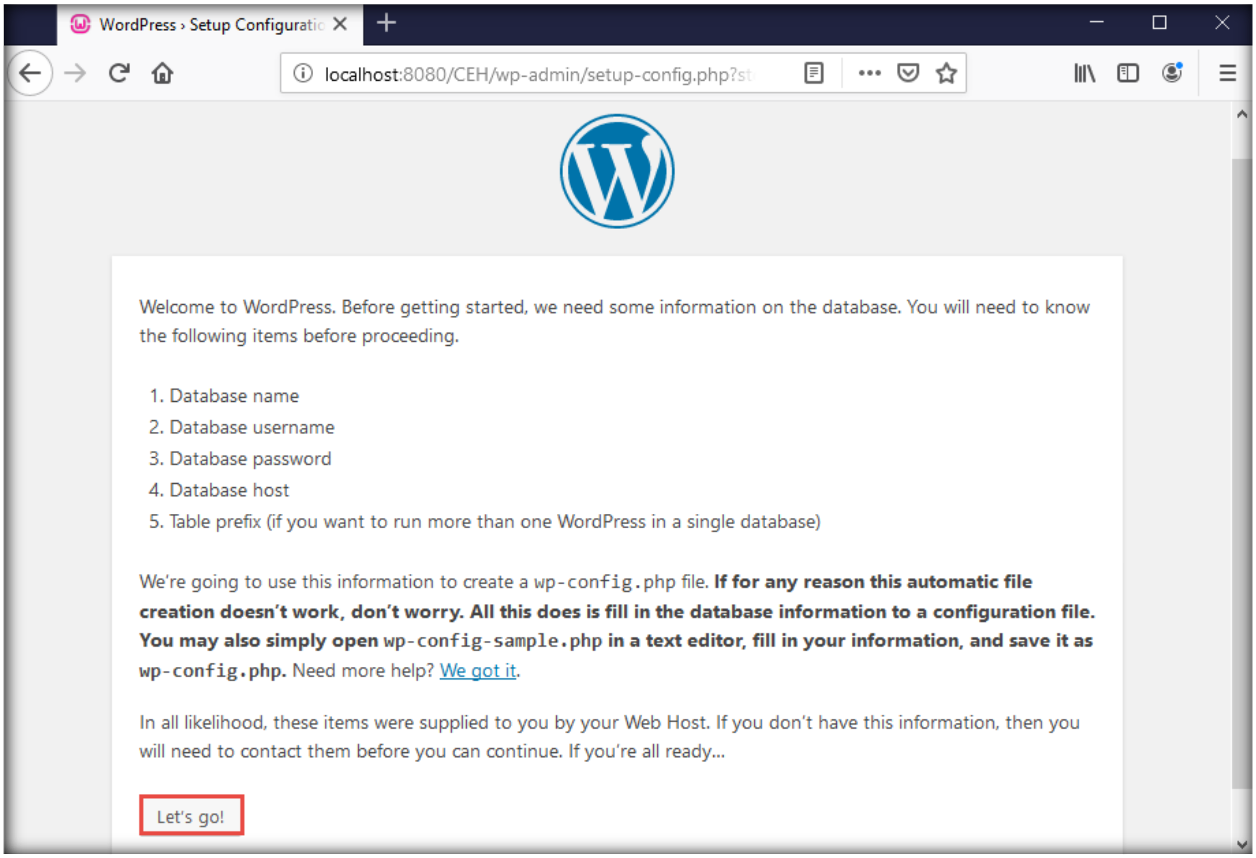
17. Launch any web browser, type the URL **http://localhost:8080/CEH**, and press **Enter**.

18. The **Setup Configuration** webpage appears; click **Continue**.

**Note**: Screenshots may differ if you are using different browser or a different version of WordPress.


WordPress › Setup Configurati
localhost:8080/CEH/wp-admin/setup-config
English (United States)
Afrikaans
العربية
العربية المغربية
অসমীয়া
Azərbaycan dili
گؤنئی آذربایجان
Беларуская мова
Български
বাংলা
བོད་ཡིག
Bosanski
Català
Cebuano
Čeština
Cymraeg
Dansk
Deutsch
Deutsch (Schweiz)
Deutsch (Sie)
Deutsch (Schweiz, Du)
རྫོང་ཁ
Ελληνικά
Continue

19. The **Setup Configuration** webpage appears; click the **Let's go!** Button.


WordPress › Setup Configuratic
localhost:8080/CEH/wp-admin/setup-config.php?st

Welcome to WordPress. Before getting started, we need some information on the database. You will need to know the following items before proceeding.

1. Database name
2. Database username
3. Database password
4. Database host
5. Table prefix (if you want to run more than one WordPress in a single database)

We're going to use this information to create a `wp-config.php` file. **If for any reason this automatic file creation doesn't work, don't worry. All this does is fill in the database information to a configuration file. You may also simply open `wp-config-sample.php` in a text editor, fill in your information, and save it as `wp-config.php`.** Need more help? We got it.

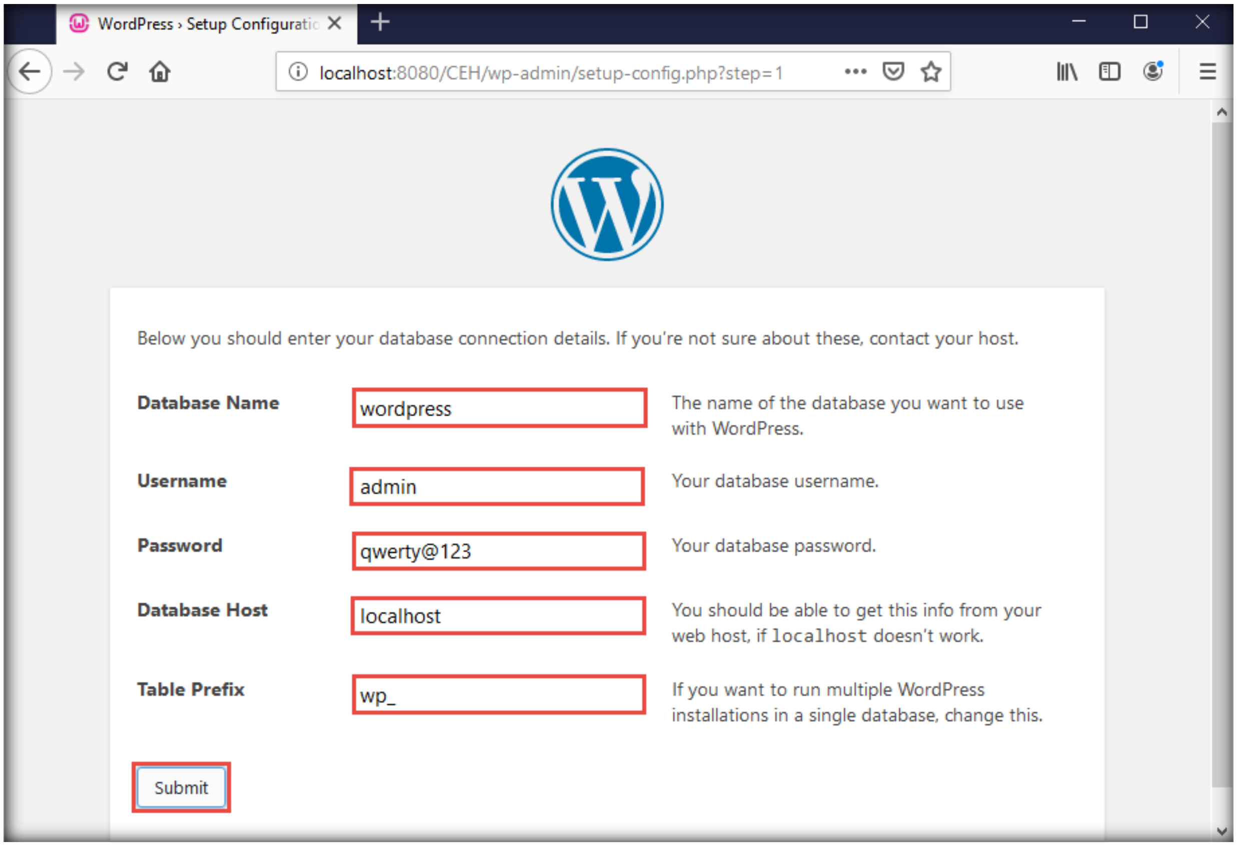
In all likelihood, these items were supplied to you by your Web Host. If you don't have this information, then you will need to contact them before you can continue. If you're all ready…

20. Now, you need to specify the database connection details.

    Type:

    - **wordpress** in the **Database Name** field
    - **admin** in the **Username** field
    - **qwerty@123** in the **Password** field
    - **localhost** in the **Database Host** field
    - **wp_** in the **Table Prefix** field

21. Click the **Submit** button.

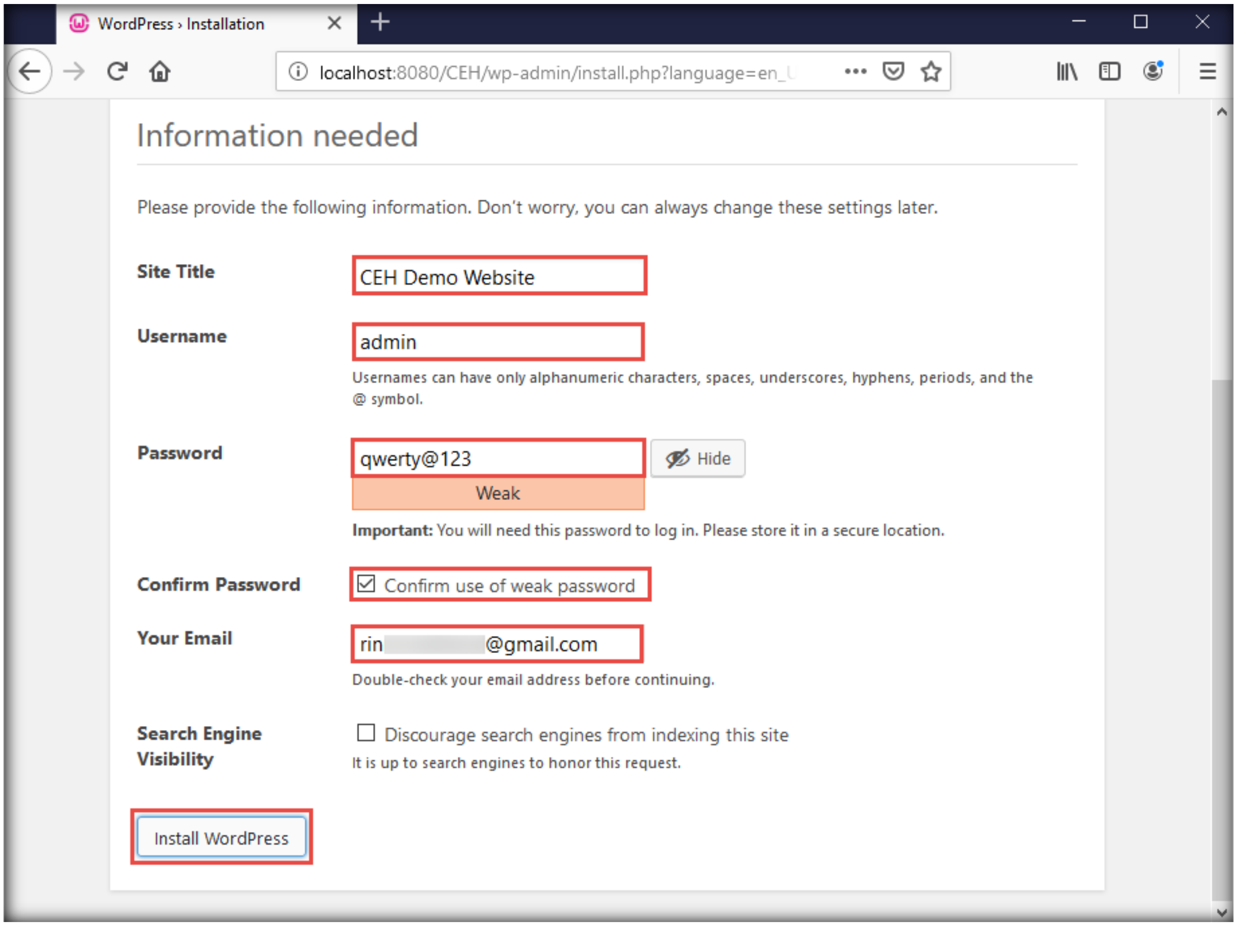

WordPress › Setup Configuratic
localhost:8080/CEH/wp-admin/setup-config.php?step=1

Below you should enter your database connection details. If you're not sure about these, contact your host.

| | | |
|---|---|---|
| **Database Name** | wordpress | The name of the database you want to use with WordPress. |
| **Username** | admin | Your database username. |
| **Password** | qwerty@123 | Your database password. |
| **Database Host** | localhost | You should be able to get this info from your web host, if `localhost` doesn't work. |
| **Table Prefix** | wp_ | If you want to run multiple WordPress installations in a single database, change this. |

22. Click the **Run the installation** button.

23. A welcome page appears; scroll down the webpage and type:
    - **CEH Demo Website** in the **Site Title** field
    - **admin** in the **Username** field
    - **qwerty@123** in the **Password** field
    - **Tick** the checkbox in the **Confirm Password** field
    - Provide your personal email ID in the **Your Email** text field
24. Click the **Install WordPress** button.



## Information needed

Please provide the following information. Don't worry, you can always change these settings later.

**Site Title**: CEH Demo Website

**Username**: admin

Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.

**Password**: qwerty@123

**Important:** You will need this password to log in. Please store it in a secure location.

**Confirm Password**: ☑ Confirm use of weak password

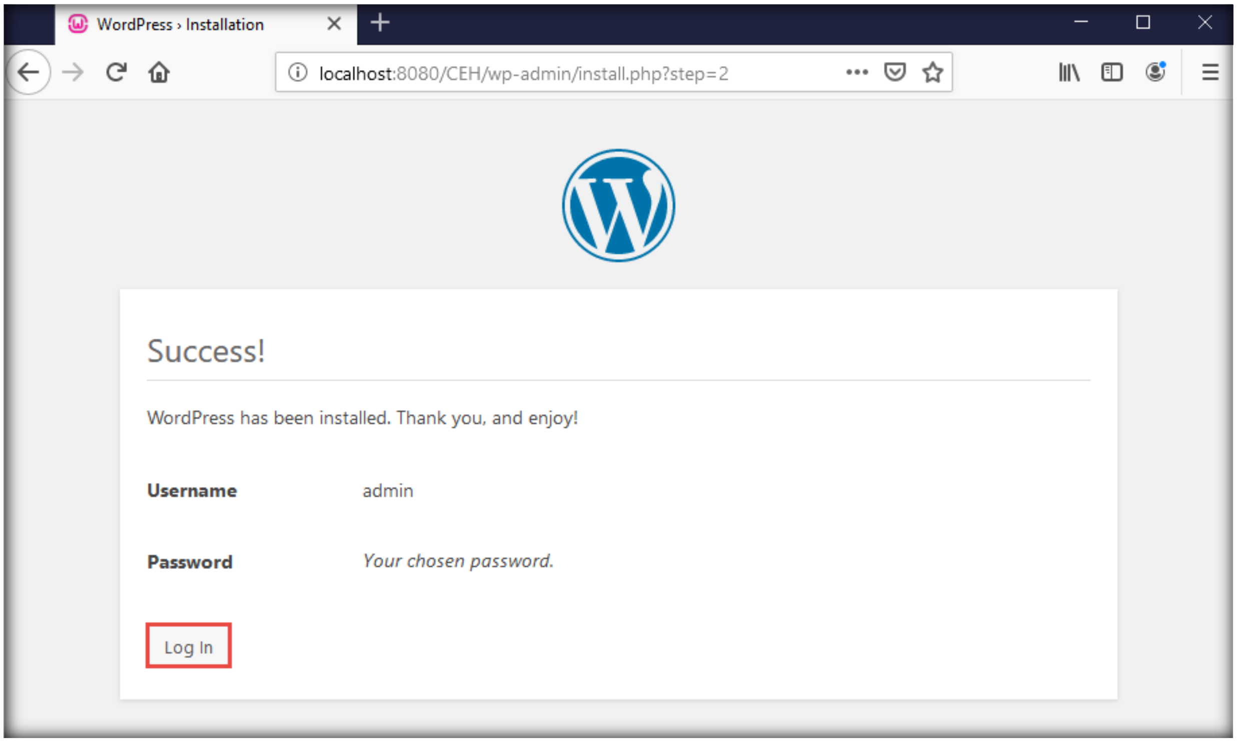
**Your Email**: rin[redacted]@gmail.com

Double-check your email address before continuing.

**Search Engine Visibility**: ☐ Discourage search engines from indexing this site

It is up to search engines to honor this request.

25. On successful installation, a webpage appears stating that the installation was successful; click the **Log in** button.


WordPress › Installation
localhost:8080/CEH/wp-admin/install.php?step=2

Success!

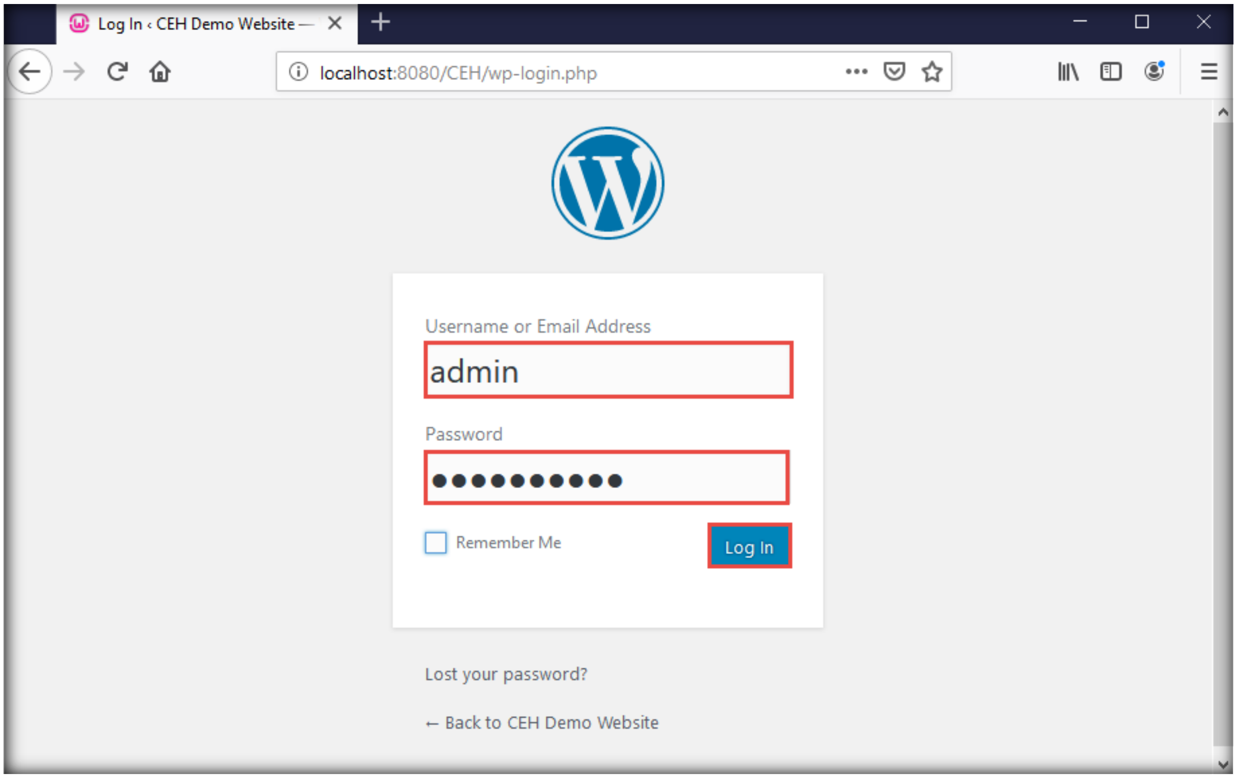
WordPress has been installed. Thank you, and enjoy!

**Username** admin

**Password** *Your chosen password.*

Log In

26. The **Log In** webpage appears; type **admin** in the **Username** field, **qwerty@123** in the **Password** field, and click the **Log In** button.


Log In ‹ CEH Demo Website —
localhost:8080/CEH/wp-login.php

Username or Email Address: admin

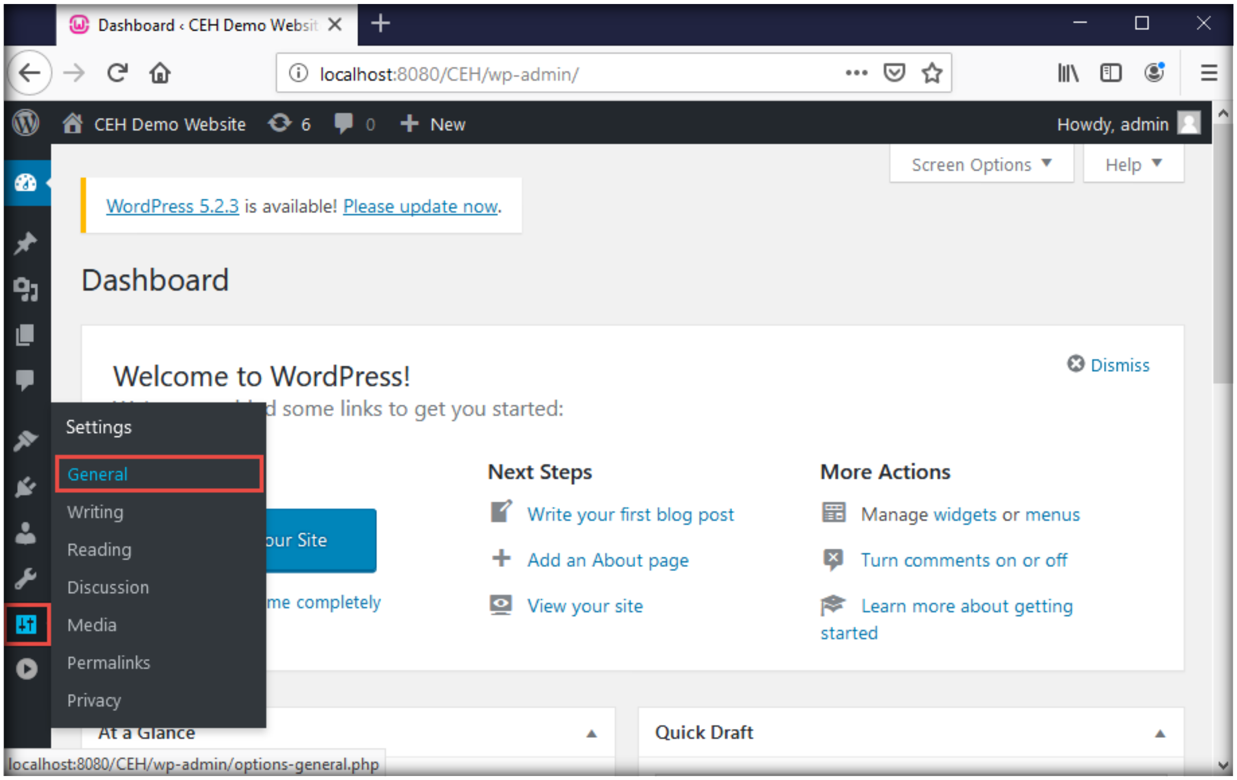
Password: ●●●●●●●●●●

☐ Remember Me
Log In
Lost your password?
← Back to CEH Demo Website

27. Once you have logged in to the website, the **WordPress Dashboard** appears.

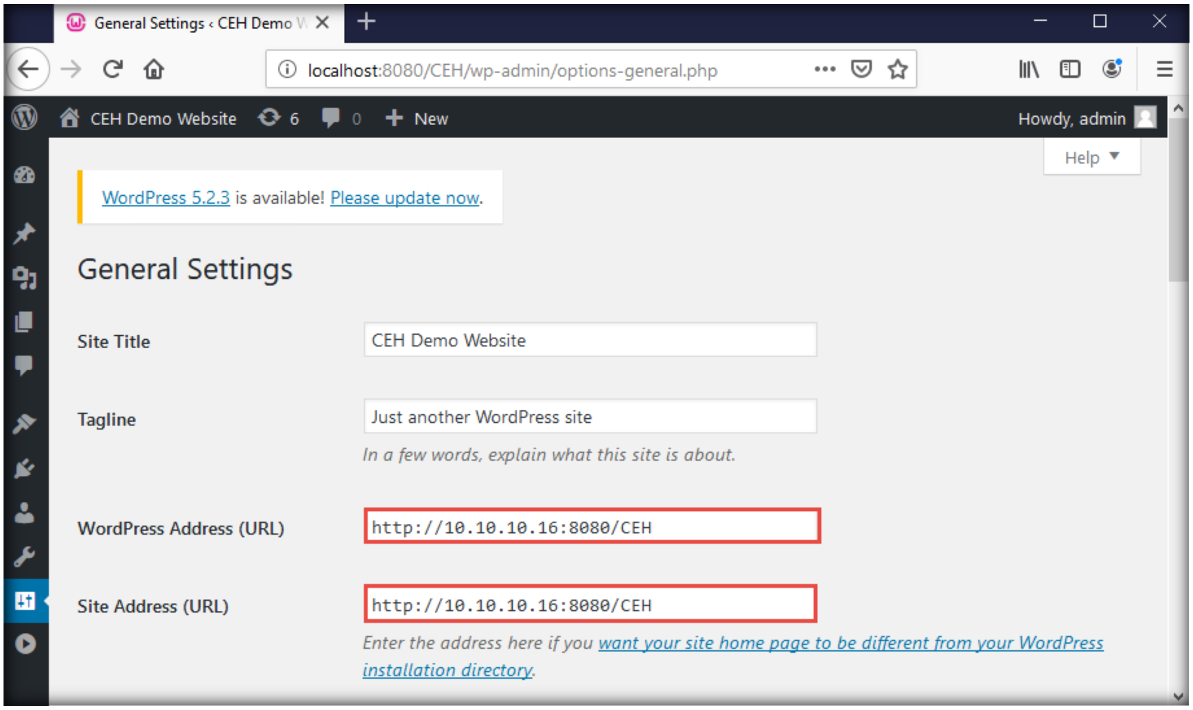
    **Note**: If an error page appears, log in again using the credentials **admin** and **qwerty@123**.

28. Hover the mouse cursor on the **Settings** icon in the left-hand pane and click **General**.


Dashboard ‹ CEH Demo Websit
localhost:8080/CEH/wp-admin/
CEH Demo Website
6
0
New
Howdy, admin
Screen Options
Help
WordPress 5.2.3 is available! Please update now.
Dashboard
Welcome to WordPress!
Dismiss
d some links to get you started:
Settings
General
Writing
Reading
Discussion
Media
Permalinks
Privacy
our Site
me completely
Next Steps
Write your first blog post
Add an About page
View your site
More Actions
Manage widgets or menus
Turn comments on or off
Learn more about getting started
At a Glance
Quick Draft
localhost:8080/CEH/wp-admin/options-general.php

29. The **General Settings** webpage appears; type **http://[IP Address of Windows Server 2016]:8080/CEH** in the **WordPress Address (URL)** and **Site Address (URL)** fields

    **Note**: In this lab setup, the IP address of **Windows Server 2016** is **10.10.10.16**, and the port on which the **apache web server** is running is **8080**. This address and port may vary in your lab environment.


General Settings ‹ CEH Demo W
localhost:8080/CEH/wp-admin/options-general.php
CEH Demo Website
6
0
New
Howdy, admin
Help

WordPress 5.2.3 is available! Please update now.

General Settings

Site Title: CEH Demo Website

Tagline: Just another WordPress site

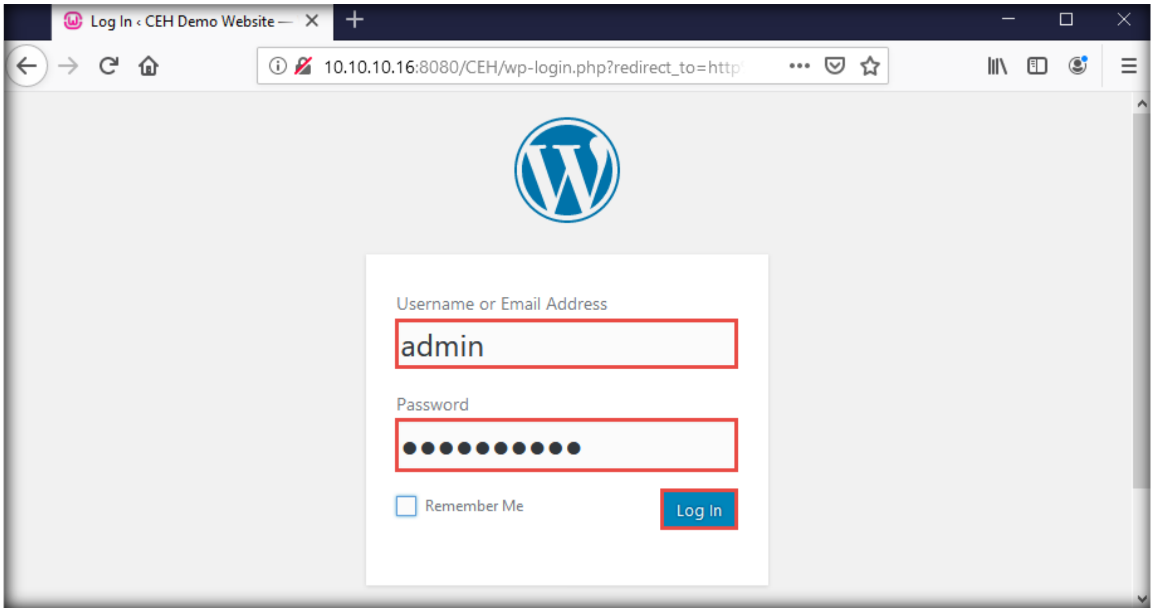
*In a few words, explain what this site is about.*

WordPress Address (URL): `http://10.10.10.16:8080/CEH`

Site Address (URL): `http://10.10.10.16:8080/CEH`

*Enter the address here if you want your site home page to be different from your WordPress installation directory.*

30. Scroll down to the end of webpage and click the **Save Changes** button.
31. On clicking the button, you will be redirected back to the login page. Here, observe the IP address of **Windows Server 2016** in the URL field instead of the localhost.
32. Enter the user credentials (**admin** and **qwerty@123**) and click the **Log In** button.

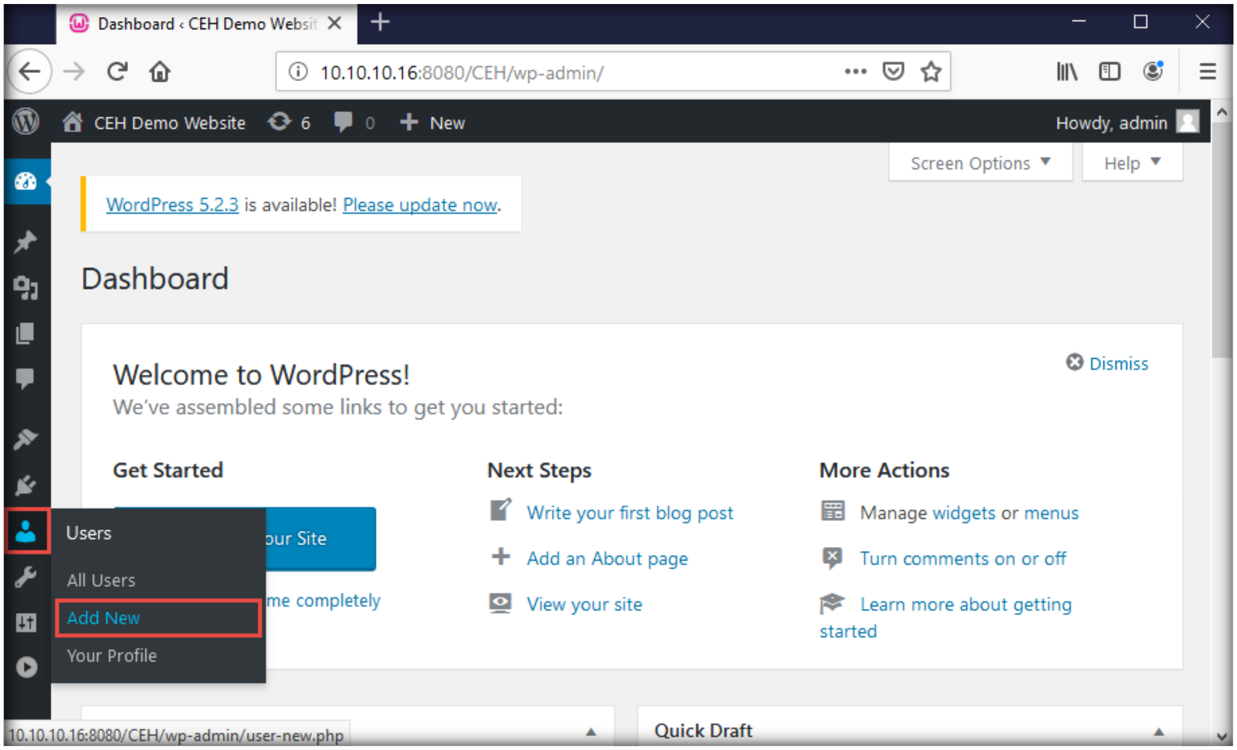

Log In ‹ CEH Demo Website —
10.10.10.16:8080/CEH/wp-login.php?redirect_to=http
Log In

Username or Email Address: admin

Password: ●●●●●●●●●●

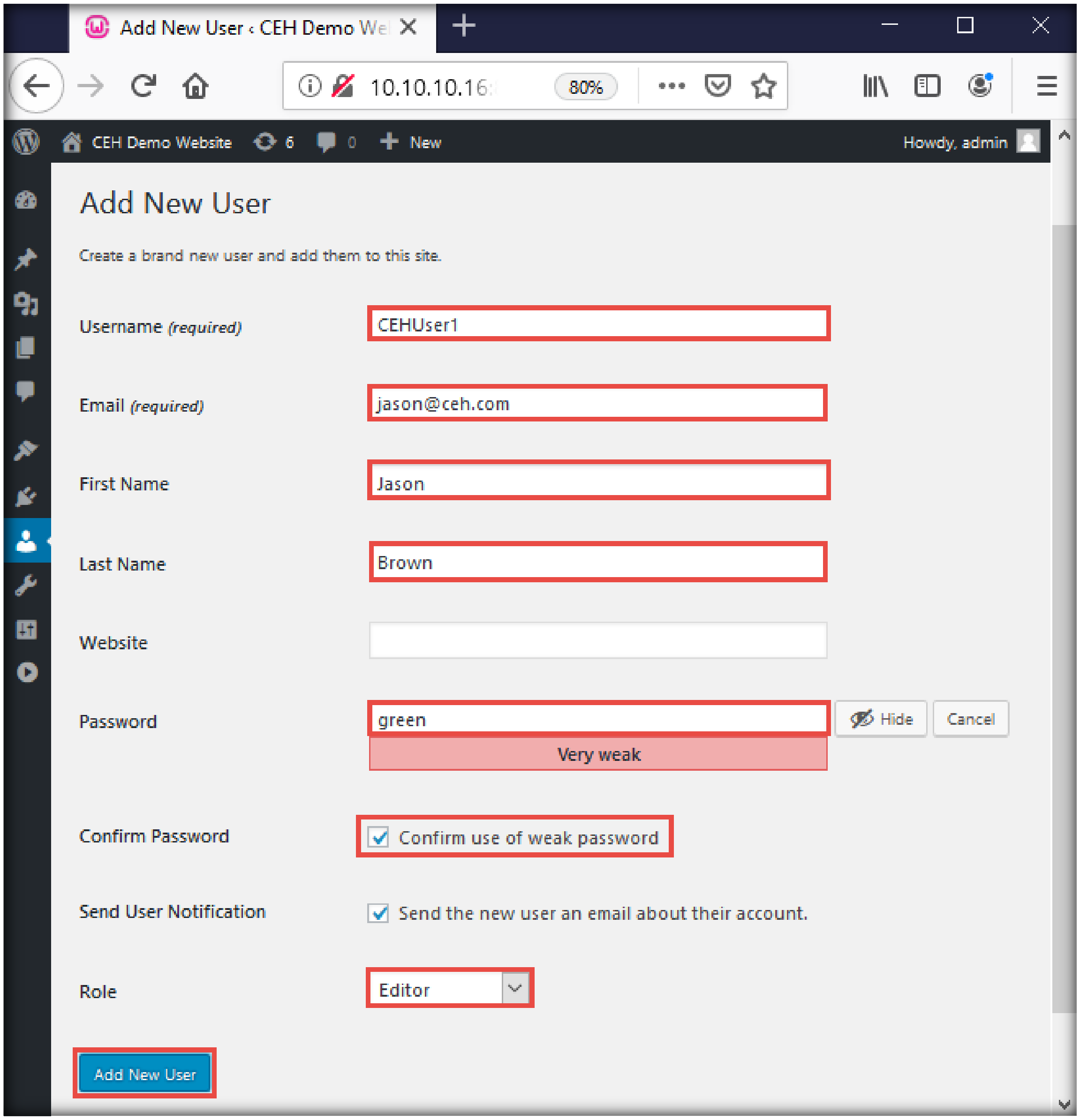
☐ Remember Me

33. Once you are logged in to the website, click **Users**, and then click **Add New**.


Dashboard ‹ CEH Demo Websit
10.10.10.16:8080/CEH/wp-admin/
CEH Demo Website
6
0
New
Howdy, admin
Screen Options
Help
WordPress 5.2.3 is available! Please update now.
Dashboard
Welcome to WordPress!
We've assembled some links to get you started:
Dismiss
Get Started
Next Steps
More Actions
Write your first blog post
Add an About page
View your site
Manage widgets or menus
Turn comments on or off
Learn more about getting started
Users
All Users
Add New
Your Profile
10.10.10.16:8080/CEH/wp-admin/user-new.php
Quick Draft

34. The **Add New User** webpage appears:
    - Enter **CEHUser1** in the **Username** field
    - Provide your personal email ID in **Email** field
    - Enter the **First** and **Last Names**, as shown in the screenshot
    - In the **Password** option, click the **Show password** button
    - Type **green** in the **Password** field

    **Note**: We are creating a user account with the Username **CEHUser1** and Password **green**.
35. **Tick** the checkbox in the **Confirm Password** field.
36. Scroll down the webpage, assign a role to the user (here, **Editor**), and click **Add New User**.



Add New User

Create a brand new user and add them to this site.

Username *(required)*: CEHUser1

Email *(required)*: jason@ceh.com

First Name: Jason

Last Name: Brown

Website:

Password: green

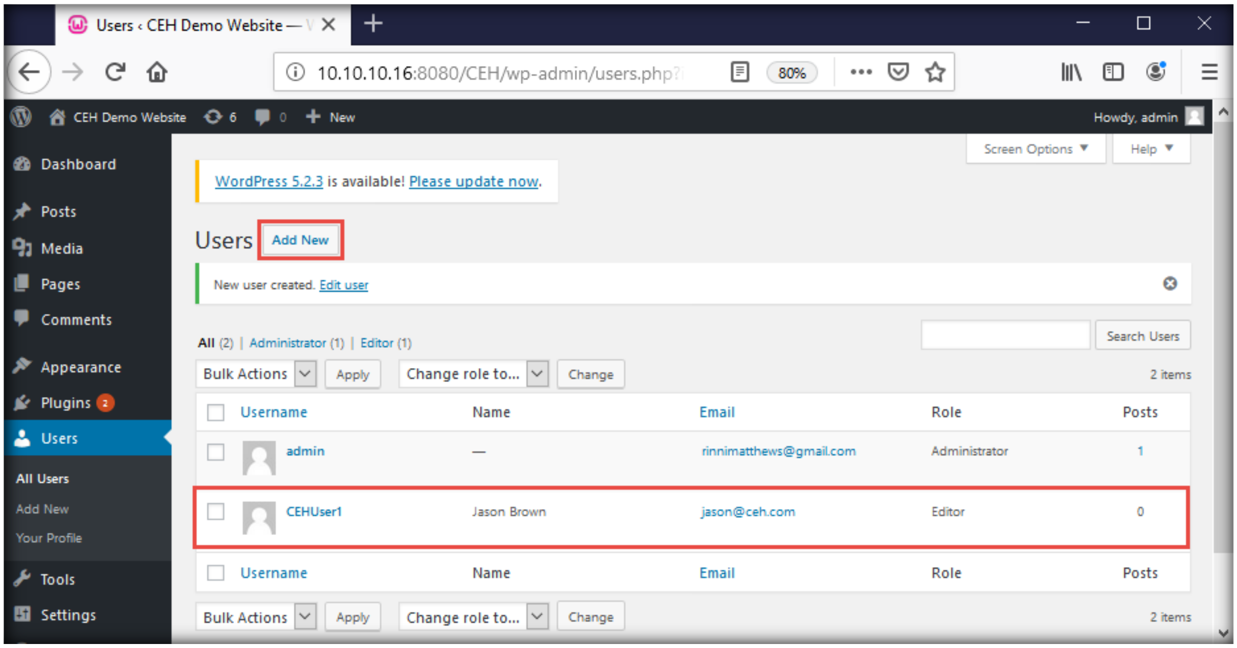
Very weak

Confirm Password: ☑ Confirm use of weak password

Send User Notification: ☑ Send the new user an email about their account.

Role: Editor

37. This creates a user account. Now, click **Add New** to create another user account.



Users ‹ CEH Demo Website — V
10.10.10.16:8080/CEH/wp-admin/users.php?
80%
CEH Demo Website
6
0
New
Howdy, admin
Dashboard
Posts
Media
Pages
Comments
Appearance
Plugins 2
Users
All Users
Add New
Your Profile
Tools
Settings
Screen Options ▼
Help ▼
Users
Add New
Search Users
Bulk Actions
Apply
Change role to...
Change

WordPress 5.2.3 is available! Please update now.

New user created. Edit user

All (2) | Administrator (1) | Editor (1)

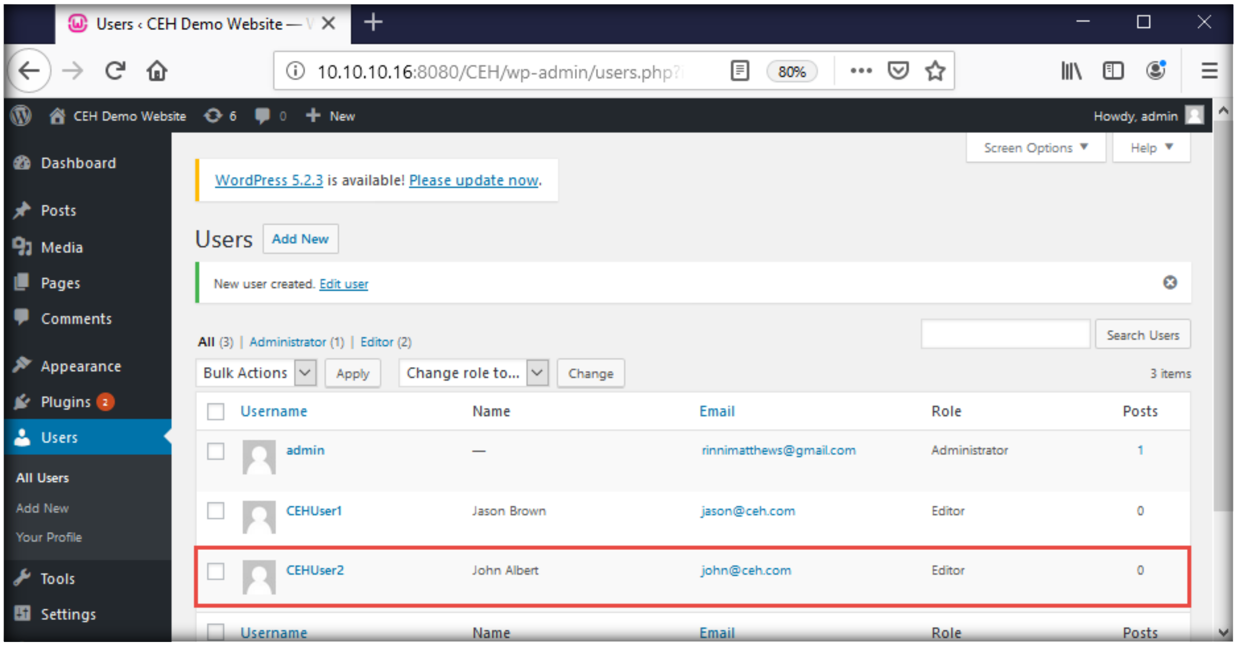
2 items

| ☐ | Username | Name | Email | Role | Posts |
|---|---|---|---|---|---|
| ☐ | admin | — | rinnimatthews@gmail.com | Administrator | 1 |
| ☐ | CEHUser1 | Jason Brown | jason@ceh.com | Editor | 0 |
| ☐ | Username | Name | Email | Role | Posts |

2 items

38. In the same way, follow the steps **34** and **36** to create a user account with the credentials (**CEHUser2** and **alpha**).

39. Once done, the added user appears, as shown in the screenshot:



Users ‹ CEH Demo Website — V
10.10.10.16:8080/CEH/wp-admin/users.php?
80%
CEH Demo Website
6
0
New
Howdy, admin
Dashboard
Posts
Media
Pages
Comments
Appearance
Plugins 2
Users
All Users
Add New
Your Profile
Tools
Settings
Screen Options ▼
Help ▼
Users
Add New
Search Users
Bulk Actions
Apply
Change role to...
Change

WordPress 5.2.3 is available! Please update now.

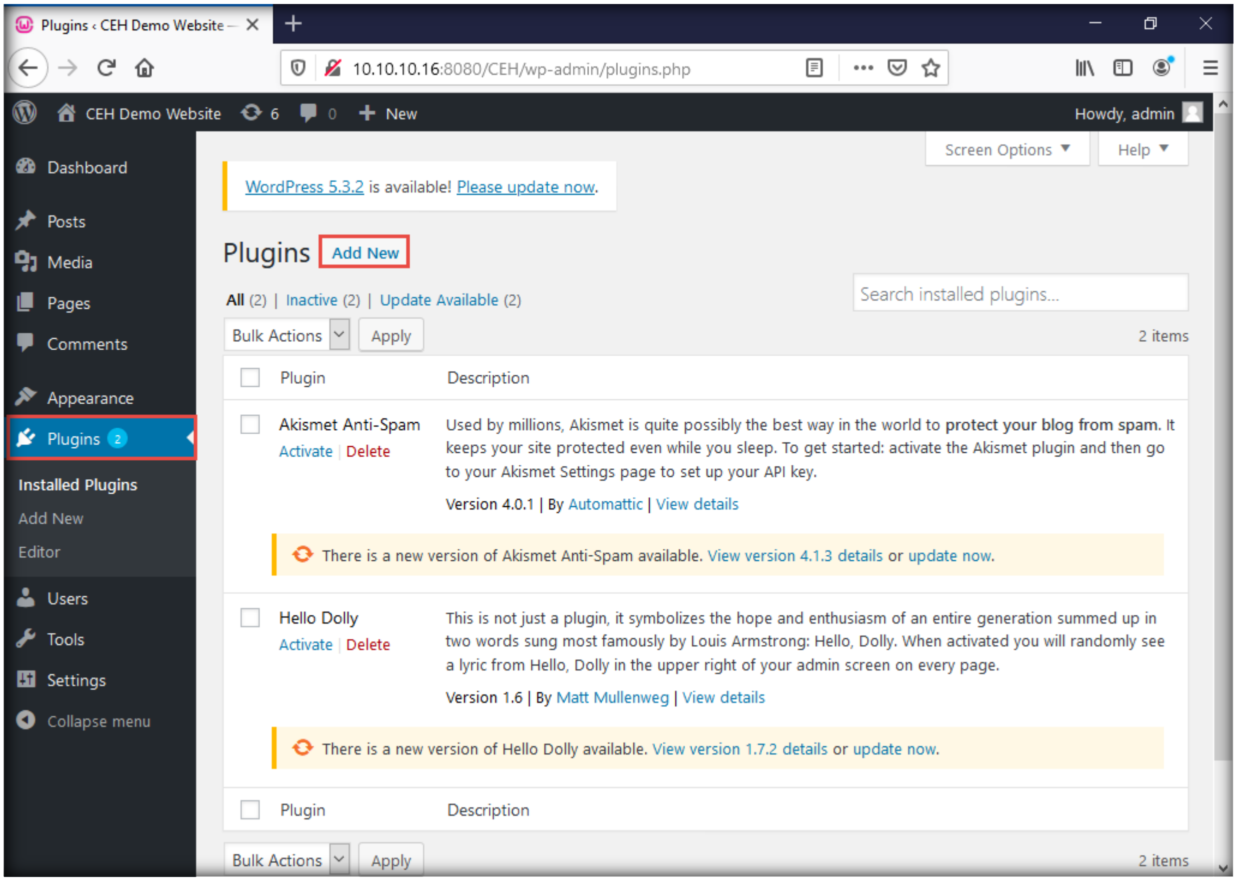
New user created. Edit user

All (3) | Administrator (1) | Editor (2)

3 items

| ☐ | Username | Name | Email | Role | Posts |
|---|---|---|---|---|---|
| ☐ | admin | — | rinnimatthews@gmail.com | Administrator | 1 |
| ☐ | CEHUser1 | Jason Brown | jason@ceh.com | Editor | 0 |
| ☐ | CEHUser2 | John Albert | john@ceh.com | Editor | 0 |
| ☐ | Username | Name | Email | Role | Posts |

40. Once the users are successfully added, click **Plugins** from the left-hand pane; and from the right-hand pane, click the **Add New** button.


Plugins ‹ CEH Demo Website —
10.10.10.16:8080/CEH/wp-admin/plugins.php
CEH Demo Website
6
0
New
Howdy, admin
Dashboard
Posts
Media
Pages
Comments
Appearance
Plugins 2
Installed Plugins
Add New
Editor
Users
Tools
Settings
Collapse menu
Screen Options ▼
Help ▼
Plugins
Add New
All (2) | Inactive (2) | Update Available (2)
Search installed plugins...
Bulk Actions
Apply
2 items
Plugin
Description
Activate | Delete
Plugin
Description
Bulk Actions
Apply
2 items

WordPress 5.3.2 is available! Please update now.

☐ Akismet Anti-Spam

Used by millions, Akismet is quite possibly the best way in the world to **protect your blog from spam**. It keeps your site protected even while you sleep. To get started: activate the Akismet plugin and then go to your Akismet Settings page to set up your API key.

Version 4.0.1 | By Automattic | View details

There is a new version of Akismet Anti-Spam available. View version 4.1.3 details or update now.

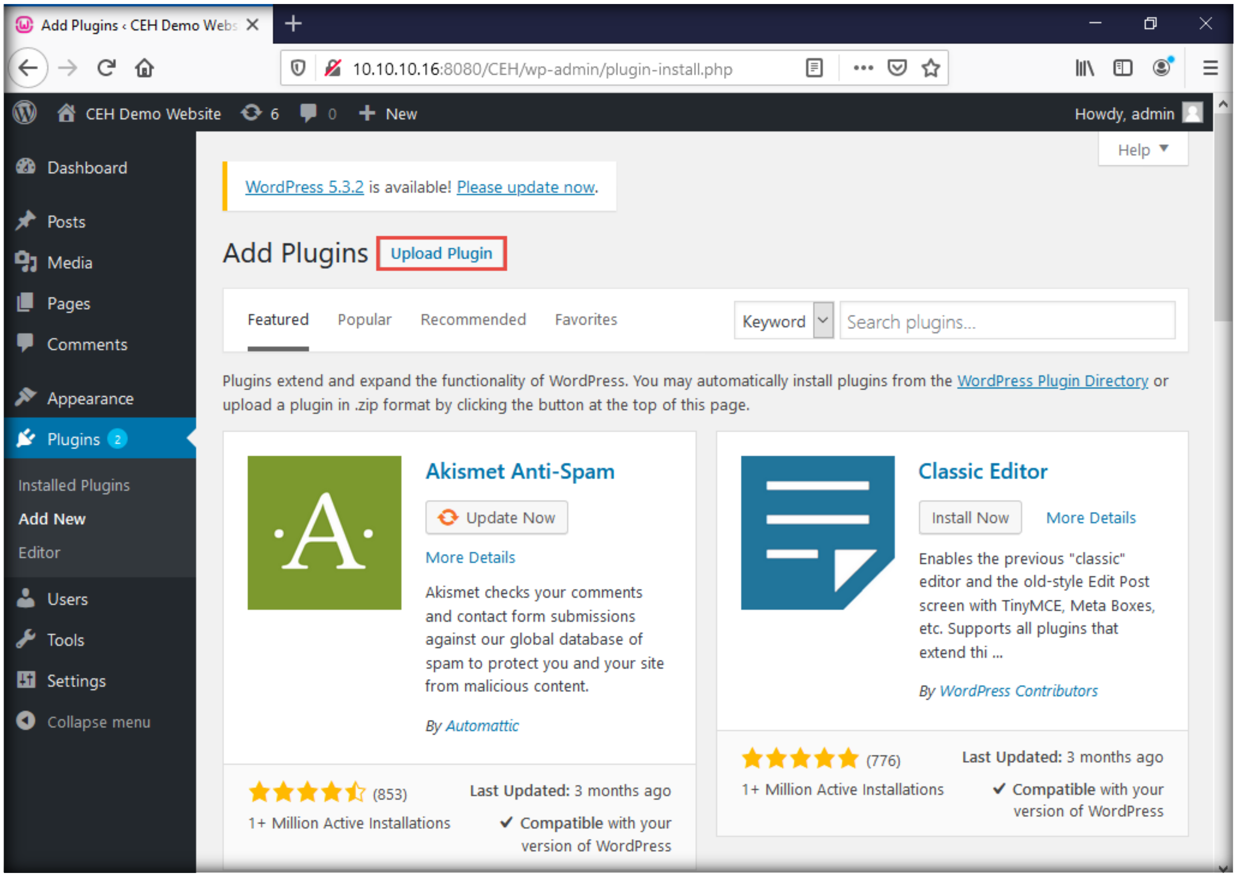
☐ Hello Dolly

This is not just a plugin, it symbolizes the hope and enthusiasm of an entire generation summed up in two words sung most famously by Louis Armstrong: Hello, Dolly. When activated you will randomly see a lyric from Hello, Dolly in the upper right of your admin screen on every page.

Version 1.6 | By Matt Mullenweg | View details

There is a new version of Hello Dolly available. View version 1.7.2 details or update now.

41. The **Add Plugins** page appears; click the **Upload Plugin** button.


Add Plugins ‹ CEH Demo Webs
10.10.10.16:8080/CEH/wp-admin/plugin-install.php
CEH Demo Website
6
0
New
Howdy, admin
Help
Dashboard
Posts
Media
Pages
Comments
Appearance
Plugins 2
Installed Plugins
Add New
Editor
Users
Tools
Settings
Collapse menu
Add Plugins
Upload Plugin
Featured
Popular
Recommended
Favorites
Keyword
Search plugins...
Akismet Anti-Spam
Update Now
More Details
Classic Editor
Install Now
More Details
(853)
(776)

WordPress 5.3.2 is available! Please update now.

Plugins extend and expand the functionality of WordPress. You may automatically install plugins from the WordPress Plugin Directory or upload a plugin in .zip format by clicking the button at the top of this page.

Akismet checks your comments and contact form submissions against our global database of spam to protect you and your site from malicious content.

By Automattic

Last Updated: 3 months ago

1+ Million Active Installations

✓ Compatible with your version of WordPress

Enables the previous "classic" editor and the old-style Edit Post screen with TinyMCE, Meta Boxes, etc. Supports all plugins that extend thi ...

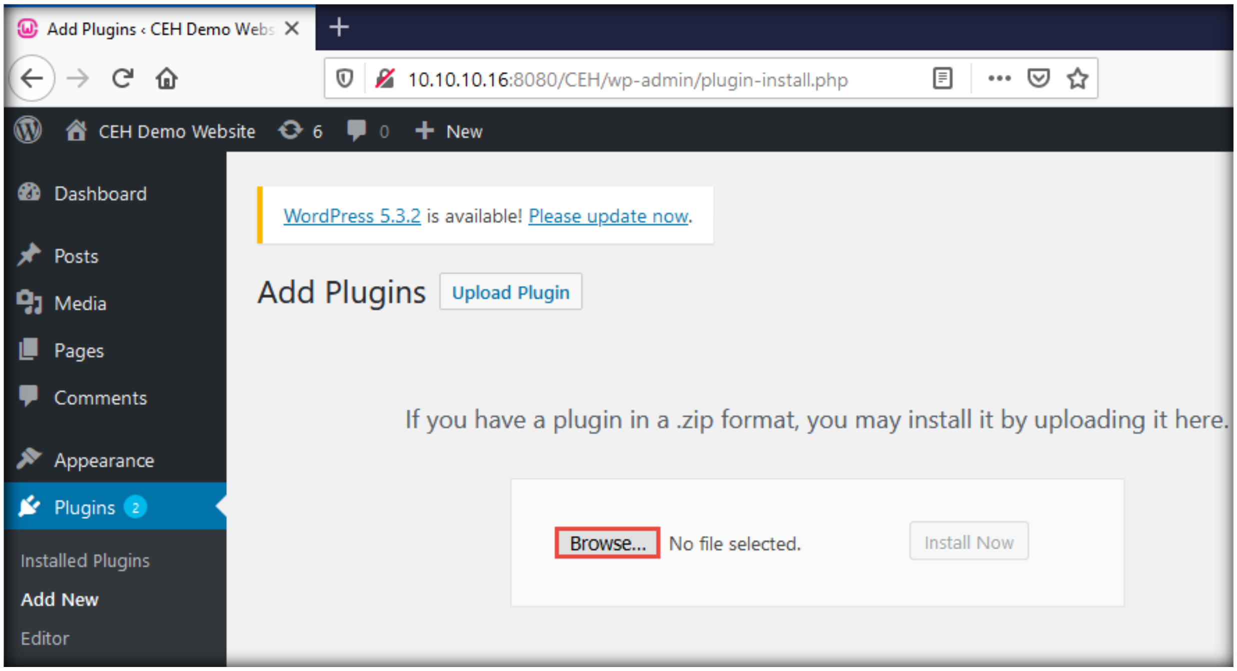
By WordPress Contributors

Last Updated: 3 months ago

1+ Million Active Installations

✓ Compatible with your version of WordPress

42. The **Add Plugins** page appears; click the **Browse...** button.

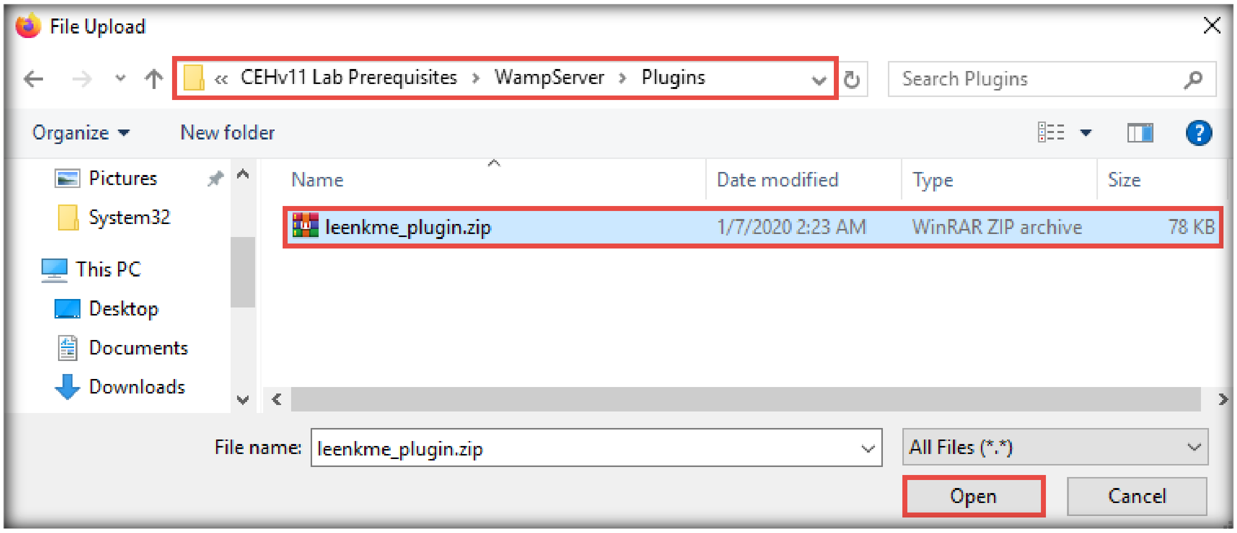

Add Plugins ‹ CEH Demo Webs
10.10.10.16:8080/CEH/wp-admin/plugin-install.php
CEH Demo Website
6
0
New
Dashboard
Posts
Media
Pages
Comments
Appearance
Plugins 2
Installed Plugins
Add New
Editor
Add Plugins
Upload Plugin
Browse...
Install Now

WordPress 5.3.2 is available! Please update now.

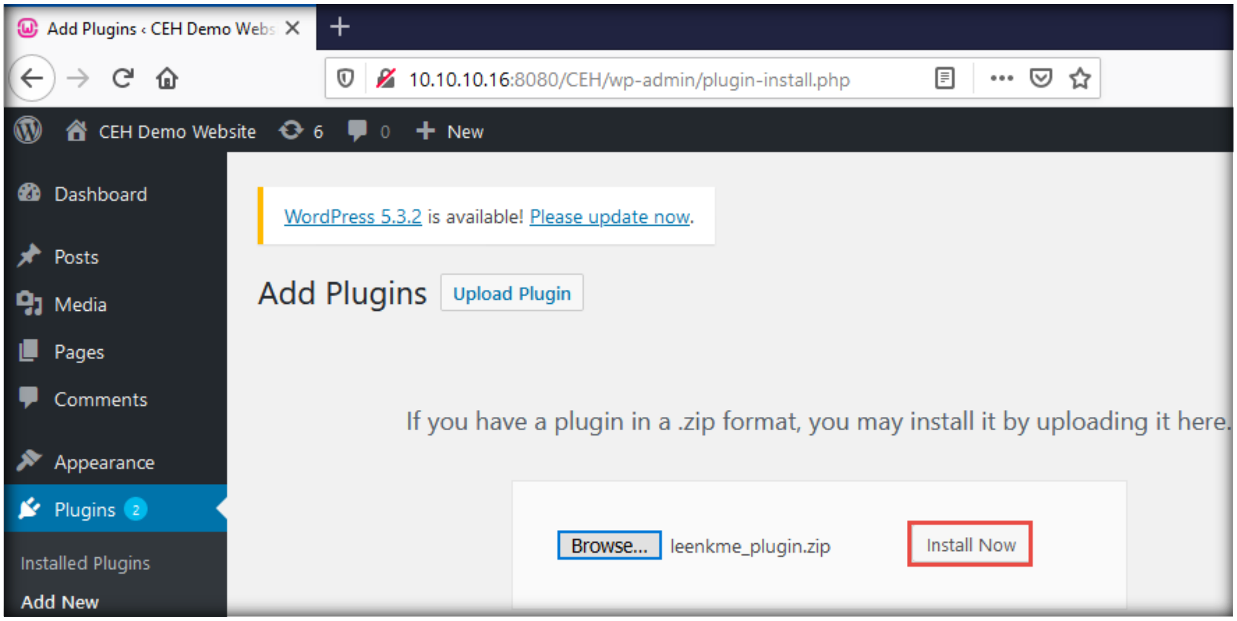
If you have a plugin in a .zip format, you may install it by uploading it here.

No file selected.

43. The **File Upload** window appears. Navigate to **E:\CEH-Tools\CEHv11 Lab Prerequisites\WampServer\Plugins**, select **leenkme_plugin.zip**, and click **Open**.


File Upload
« CEHv11 Lab Prerequisites › WampServer › Plugins
Search Plugins
Organize
New folder
Pictures
System32
This PC
Desktop
Documents
Downloads
Name
Date modified
Type
Size
leenkme_plugin.zip
1/7/2020 2:23 AM
WinRAR ZIP archive
78 KB
File name:
leenkme_plugin.zip
All Files (*.*)
Open
Cancel

44. Observe that the selected plugin file appears beside the **Browse...** button (**leenkme_plugin.zip**). Click **Install Now** to install the selected plugin.

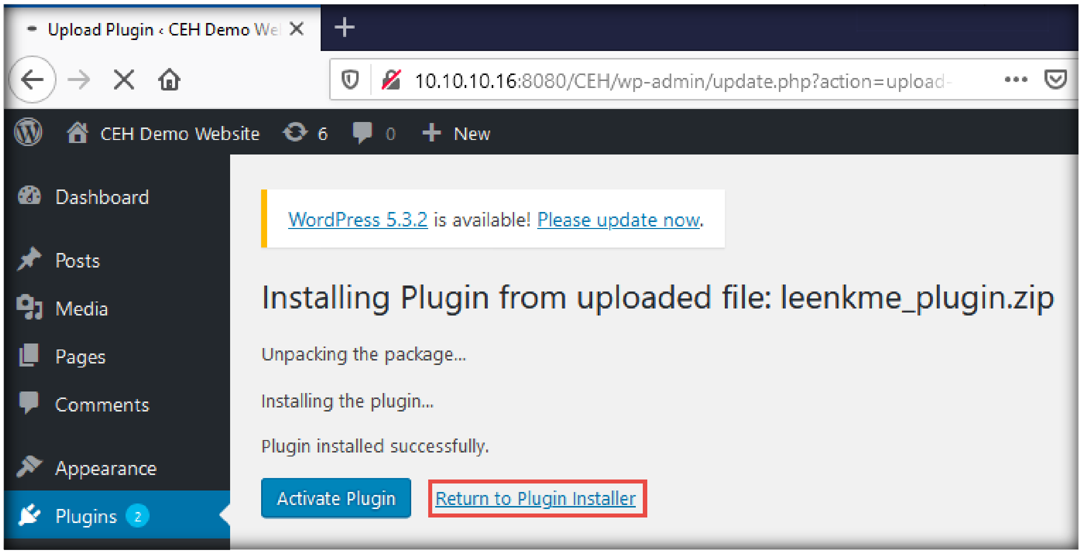

Add Plugins ‹ CEH Demo Webs
10.10.10.16:8080/CEH/wp-admin/plugin-install.php
CEH Demo Website
6
0
New
Dashboard
Posts
Media
Pages
Comments
Appearance
Plugins 2
Installed Plugins
Add New
Upload Plugin
Browse...
leenkme_plugin.zip
Install Now

WordPress 5.3.2 is available! Please update now.

Add Plugins

If you have a plugin in a .zip format, you may install it by uploading it here.

45. Installation of the plugin begins. After it completes, click the **Return to Plugin Installer** hyperlink.


Upload Plugin ‹ CEH Demo We
10.10.10.16:8080/CEH/wp-admin/update.php?action=upload-
CEH Demo Website
6
0
New
Dashboard
Posts
Media
Pages
Comments
Appearance
Plugins 2
Activate Plugin
Return to Plugin Installer

WordPress 5.3.2 is available! Please update now.

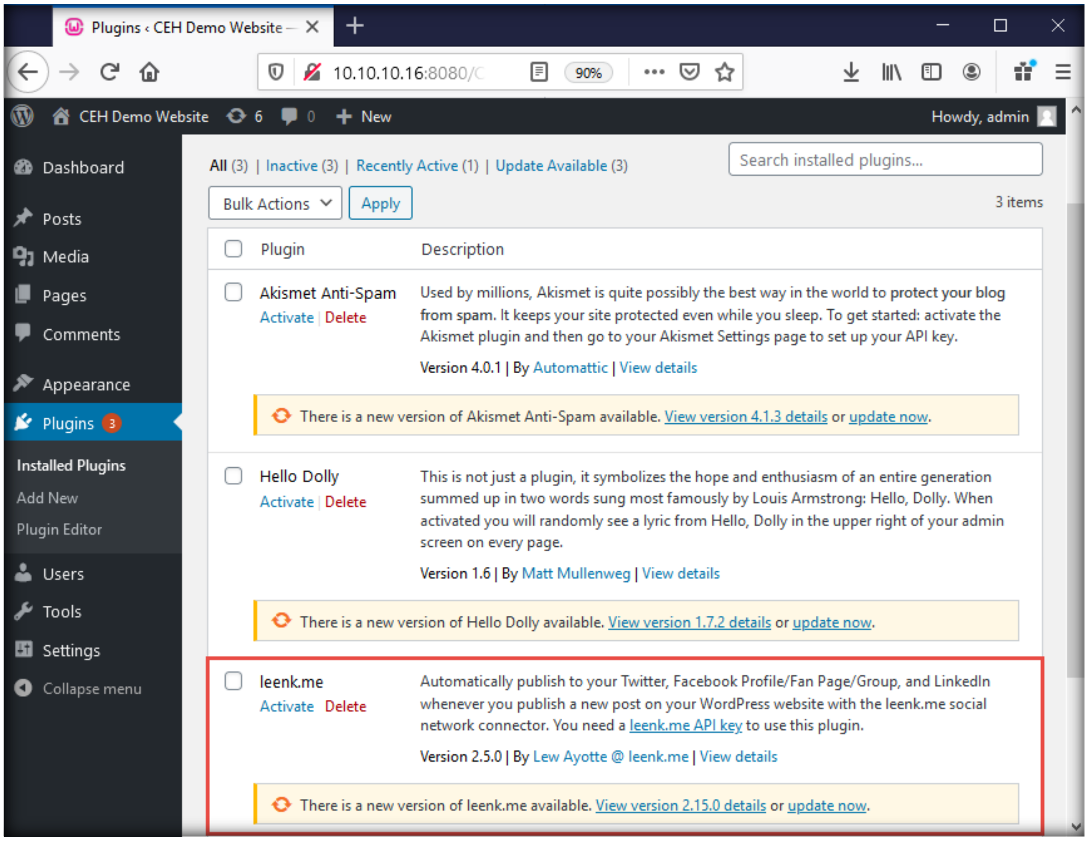
Installing Plugin from uploaded file: leenkme_plugin.zip

Unpacking the package…

Installing the plugin…

Plugin installed successfully.

46. The **Plugins** page appears. Observe that the newly added **leenk.me** plugin now appears, as shown in the screenshot.


Plugins ‹ CEH Demo Website –
10.10.10.16:8080/C
90%
CEH Demo Website
6
0
New
Howdy, admin
Dashboard
Posts
Media
Pages
Comments
Appearance
Plugins 3
Installed Plugins
Add New
Plugin Editor
Users
Tools
Settings
Collapse menu
All (3) | Inactive (3) | Recently Active (1) | Update Available (3)
Search installed plugins...
Bulk Actions
Apply
3 items

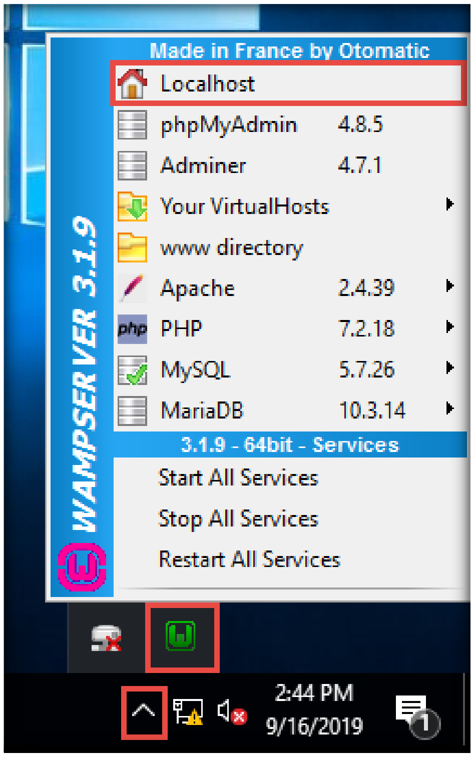
| Plugin | Description |
|---|---|
| Akismet Anti-Spam<br>Activate \| Delete | Used by millions, Akismet is quite possibly the best way in the world to protect your blog from spam. It keeps your site protected even while you sleep. To get started: activate the Akismet plugin and then go to your Akismet Settings page to set up your API key.<br>Version 4.0.1 \| By Automattic \| View details |
| | There is a new version of Akismet Anti-Spam available. View version 4.1.3 details or update now. |
| Hello Dolly<br>Activate \| Delete | This is not just a plugin, it symbolizes the hope and enthusiasm of an entire generation summed up in two words sung most famously by Louis Armstrong: Hello, Dolly. When activated you will randomly see a lyric from Hello, Dolly in the upper right of your admin screen on every page.<br>Version 1.6 \| By Matt Mullenweg \| View details |
| | There is a new version of Hello Dolly available. View version 1.7.2 details or update now. |
| leenk.me<br>Activate \| Delete | Automatically publish to your Twitter, Facebook Profile/Fan Page/Group, and LinkedIn whenever you publish a new post on your WordPress website with the leenk.me social network connector. You need a leenk.me API key to use this plugin.<br>Version 2.5.0 \| By Lew Ayotte @ leenk.me \| View details |
| | There is a new version of leenk.me available. View version 2.15.0 details or update now. |

47. Once the plugin is successfully added, hover the mouse cursor over the **admin** account field in the top-right corner and click **Log Out**.

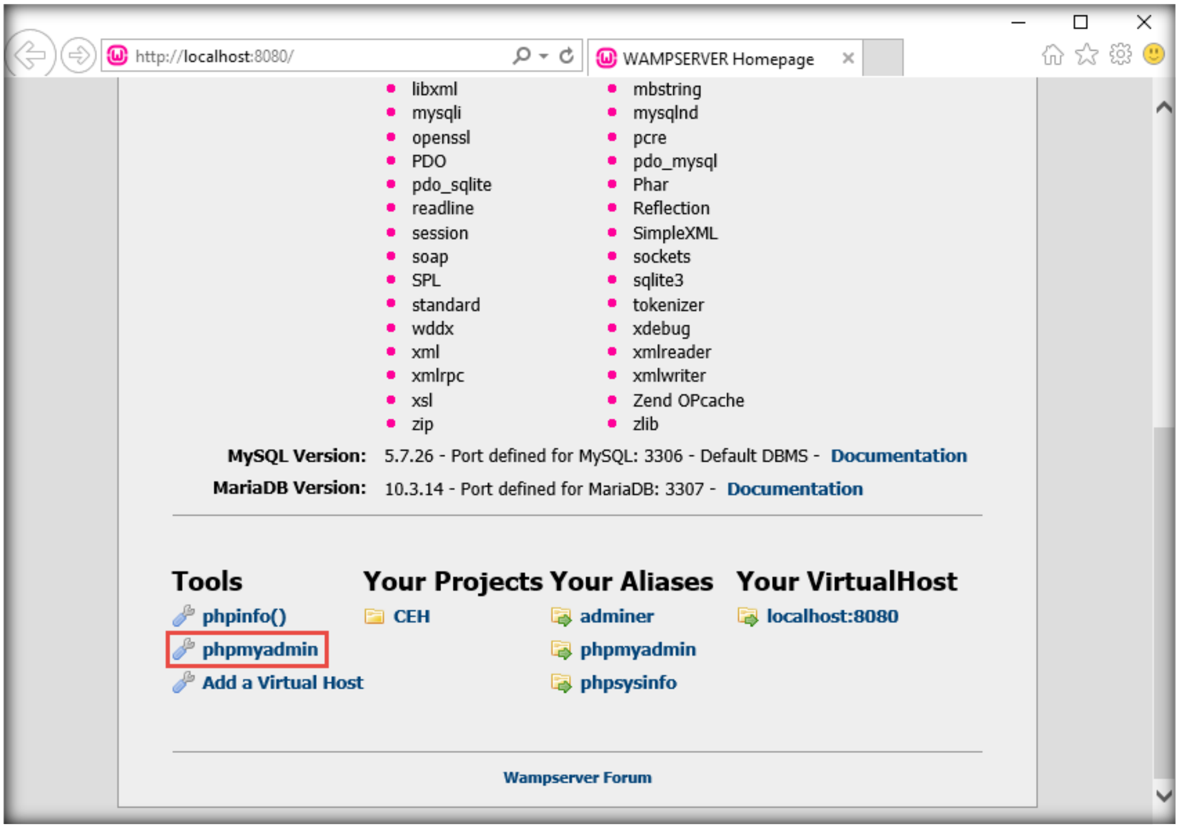
[Back to Configuration Task Outline]

# CT#41: Install and Configure Damn Vulnerable Web Application on the Windows Server 2016 Virtual Machine

1. On the **Windows Server 2016** virtual machine, click the **WampServer** icon from the notification area and choose **Localhost** from the context menu.


Made in France by Otomatic
WAMPSERVER 3.1.9
Localhost
phpMyAdmin 4.8.5
Adminer 4.7.1
Your VirtualHosts
www directory
Apache 2.4.39
PHP 7.2.18
MySQL 5.7.26
MariaDB 10.3.14
3.1.9 - 64bit - Services
Start All Services
Stop All Services
Restart All Services
2:44 PM
9/16/2019

2. As soon as you click the icon, the WampServer home page appears in the default browser. Click the **phpmyadmin** link under the **Tools** section.


http://localhost:8080/
WAMPSERVER Homepage

- libxml
- mysqli
- openssl
- PDO
- pdo_sqlite
- readline
- session
- soap
- SPL
- standard
- wddx
- xml
- xmlrpc
- xsl
- zip
- mbstring
- mysqlnd
- pcre
- pdo_mysql
- Phar
- Reflection
- SimpleXML
- sockets
- sqlite3
- tokenizer
- xdebug
- xmlreader
- xmlwriter
- Zend OPcache
- zlib

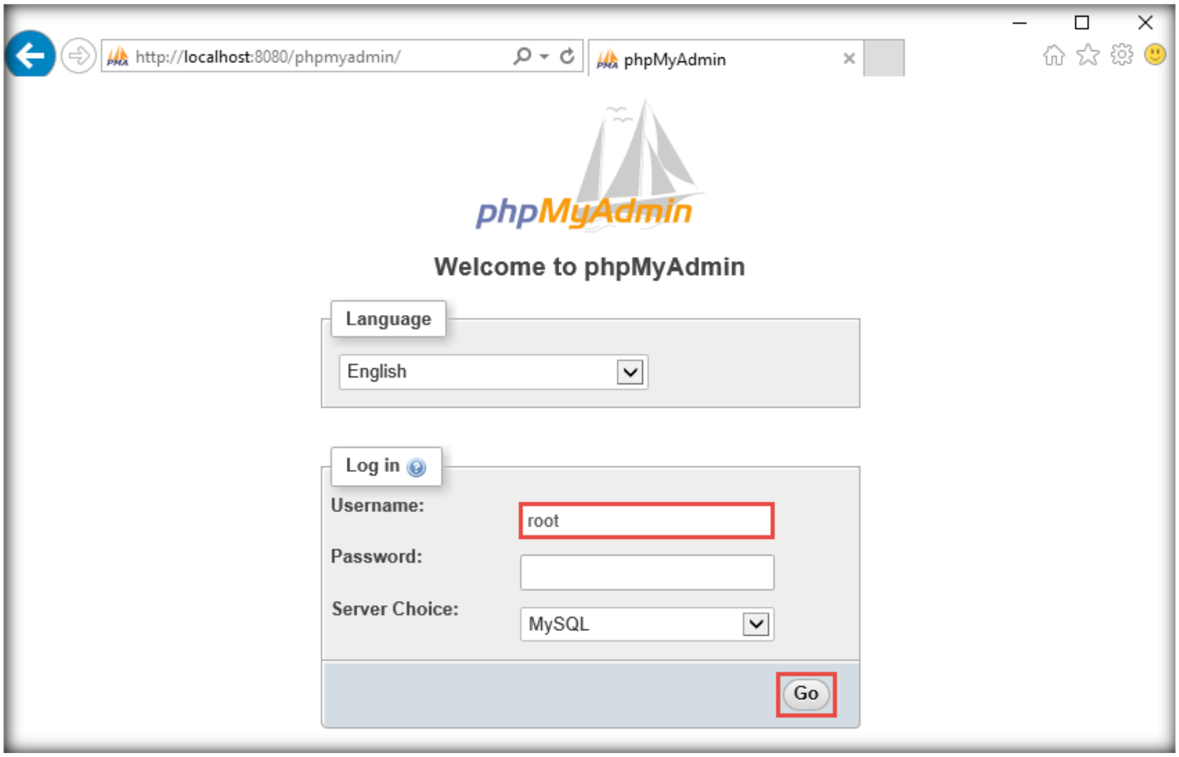
**MySQL Version:** 5.7.26 - Port defined for MySQL: 3306 - Default DBMS - Documentation

**MariaDB Version:** 10.3.14 - Port defined for MariaDB: 3307 - Documentation

| Tools | Your Projects | Your Aliases | Your VirtualHost |
|---|---|---|---|
| phpinfo() | CEH | adminer | localhost:8080 |
| phpmyadmin | | phpmyadmin | |
| Add a Virtual Host | | phpsysinfo | |

Wampserver Forum

3. The **phpMyAdmin** login page appears; type **root** as the username and click **Go**.


http://localhost:8080/phpmyadmin/
phpMyAdmin
phpMyAdmin
Welcome to phpMyAdmin
Language
Log in
Go

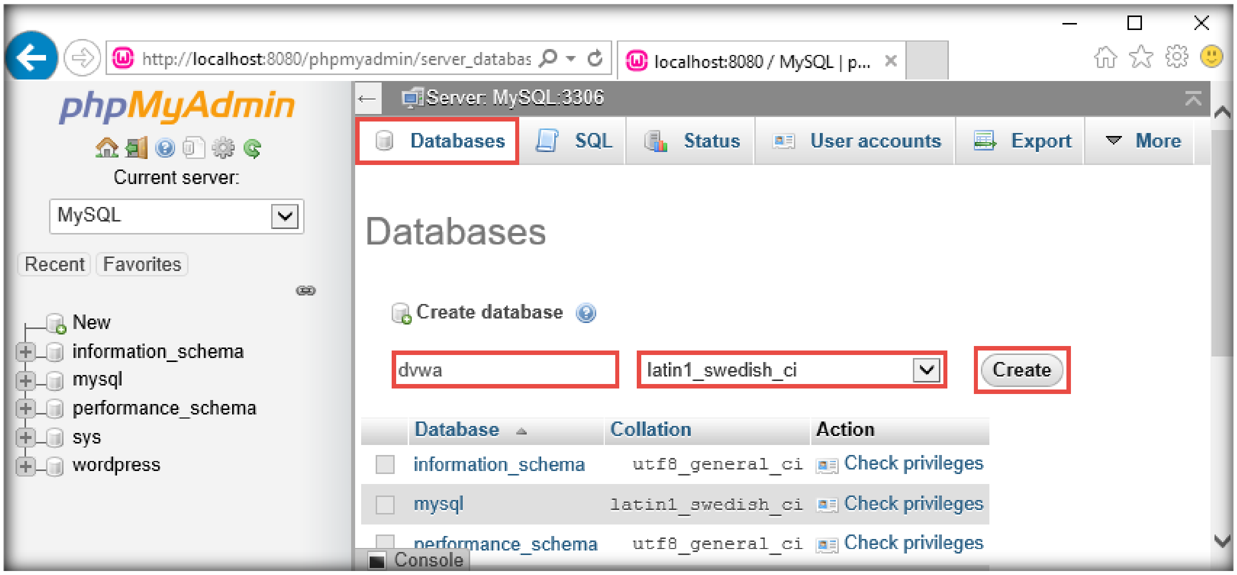
Language: English

Username: root

Password:

Server Choice: MySQL

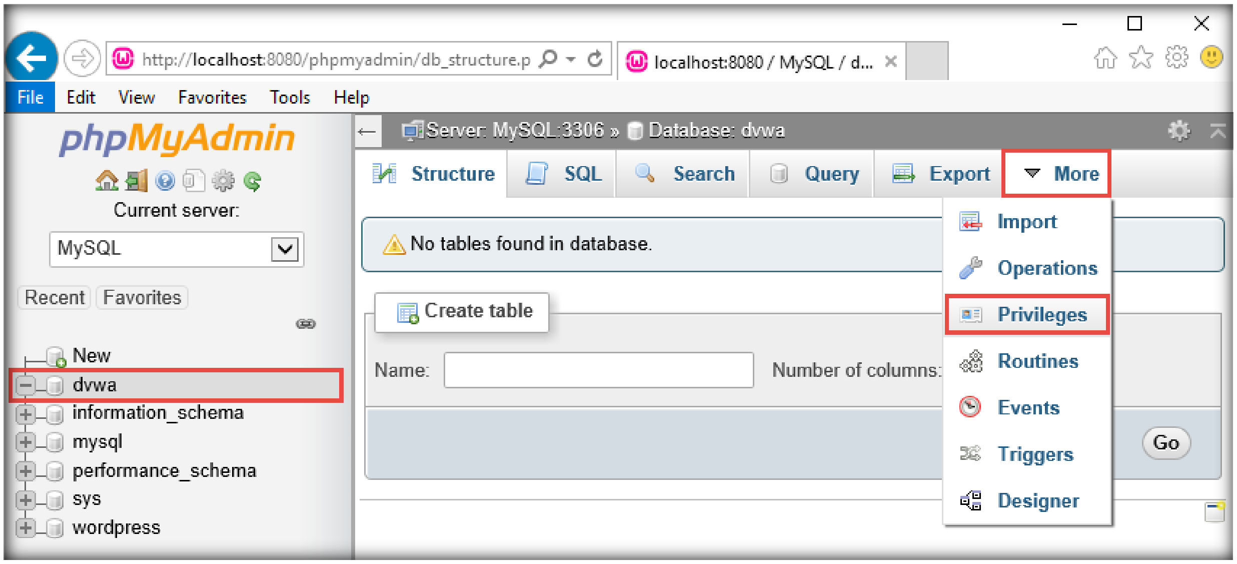
4. The **phpMyAdmin** webpage appears; click the **Databases** tab.
5. The **Databases** webpage appears. Type **dvwa** in the **Create database** text field, leave the drop-down list set to default as **latin1_swedish_ci**, and click **Create** to create a database named dvwa.


http://localhost:8080/phpmyadmin/server_databas
localhost:8080 / MySQL | p...
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
information_schema
mysql
performance_schema
sys
wordpress
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
More
Databases
Create database
Create
Console

Create database: dvwa — latin1_swedish_ci

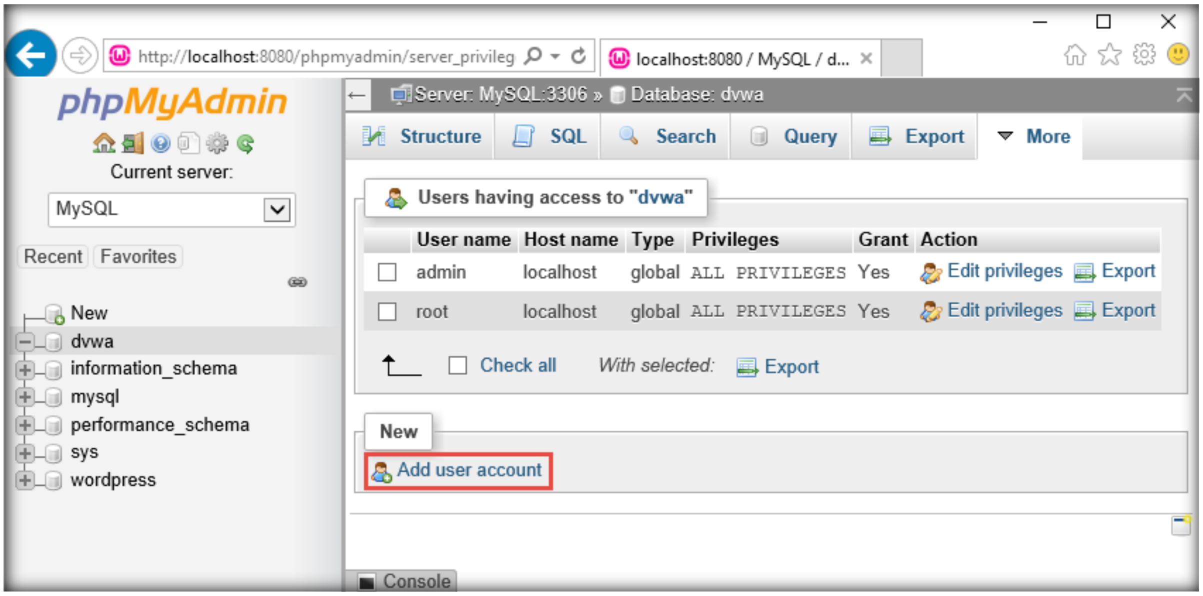
| | Database | Collation | Action |
|---|---|---|---|
| ☐ | information_schema | utf8_general_ci | Check privileges |
| ☐ | mysql | latin1_swedish_ci | Check privileges |
| ☐ | performance_schema | utf8_general_ci | Check privileges |

6. On successful creation of the database, a pop-up appears stating that the database has been created.
7. The newly added database appears in the left pane; click on it. DVWA database's webpage appears; click **More** → **Privileges**.


http://localhost:8080/phpmyadmin/db_structure.p
localhost:8080 / MySQL / d...
File
Edit
View
Favorites
Tools
Help
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
dvwa
information_schema
mysql
performance_schema
sys
wordpress
Server: MySQL:3306 » Database: dvwa
Structure
SQL
Search
Query
Export
More
Import
Operations
Privileges
Routines
Events
Triggers
Designer
Create table
Name:
Number of columns:
Go

No tables found in database.

8. Here, you will be adding a user to the database. To begin, click the **Add user account** link.


http://localhost:8080/phpmyadmin/server_privileg
localhost:8080 / MySQL / d...
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
dvwa
information_schema
mysql
performance_schema
sys
wordpress
Server: MySQL:3306 » Database: dvwa
Structure
SQL
Search
Query
Export
More
Check all
With selected:
Export
New
Add user account
Console

Users having access to "dvwa"

| | User name | Host name | Type | Privileges | Grant | Action |
|---|---|---|---|---|---|---|
| ☐ | admin | localhost | global | ALL PRIVILEGES | Yes | Edit privileges Export |
| ☐ | root | localhost | global | ALL PRIVILEGES | Yes | Edit privileges Export |

9. The **Add user** page appears.

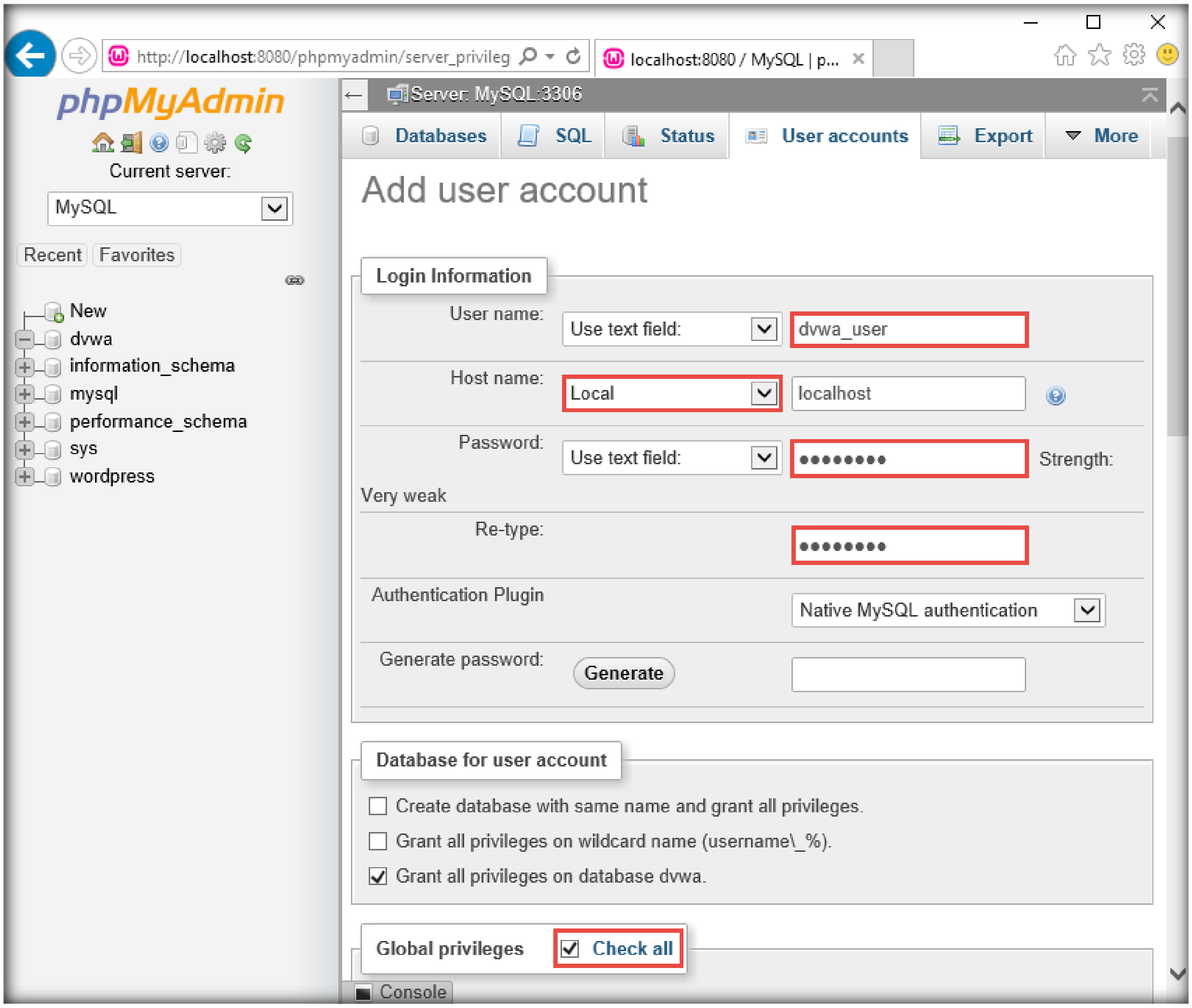
   Under the **Login Information** section:

   - Type **dvwa_user** in the **User name** text field
   - Select **Local** from the **Host name** drop-down list
   - Type the password as **test@123** in the **Password** and **Re-type** password fields

   In the **Global privileges** section:

   - Select the **Check all** checkbox

10. Click the **Go** button at the bottom of the page.


http://localhost:8080/phpmyadmin/server_privileg
localhost:8080 / MySQL | p...
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
dvwa
information_schema
mysql
performance_schema
sys
wordpress
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
More
Console

Add user account

Login Information

User name: Use text field: dvwa_user

Host name: Local localhost

Password: Use text field: ●●●●●●●● Strength:

Very weak

Re-type: ●●●●●●●●

Authentication Plugin: Native MySQL authentication

Generate password: Generate

Database for user account

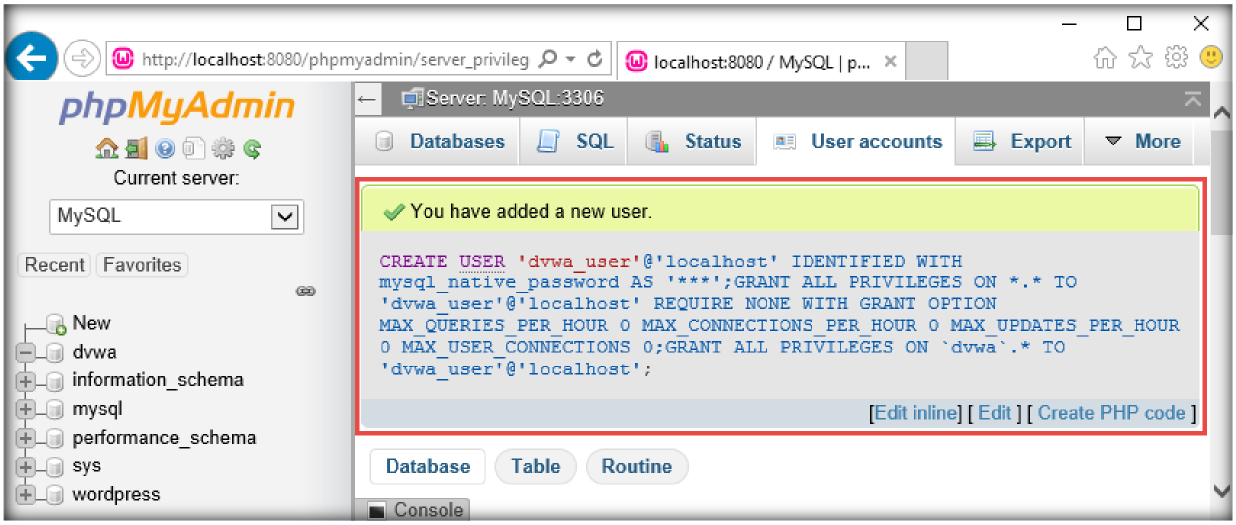
☐ Create database with same name and grant all privileges.

☐ Grant all privileges on wildcard name (username_%).

☑ Grant all privileges on database dvwa.

Global privileges ☑ Check all

11. Observe the newly added user in the dvwa database's webpage, as shown in the screenshot.

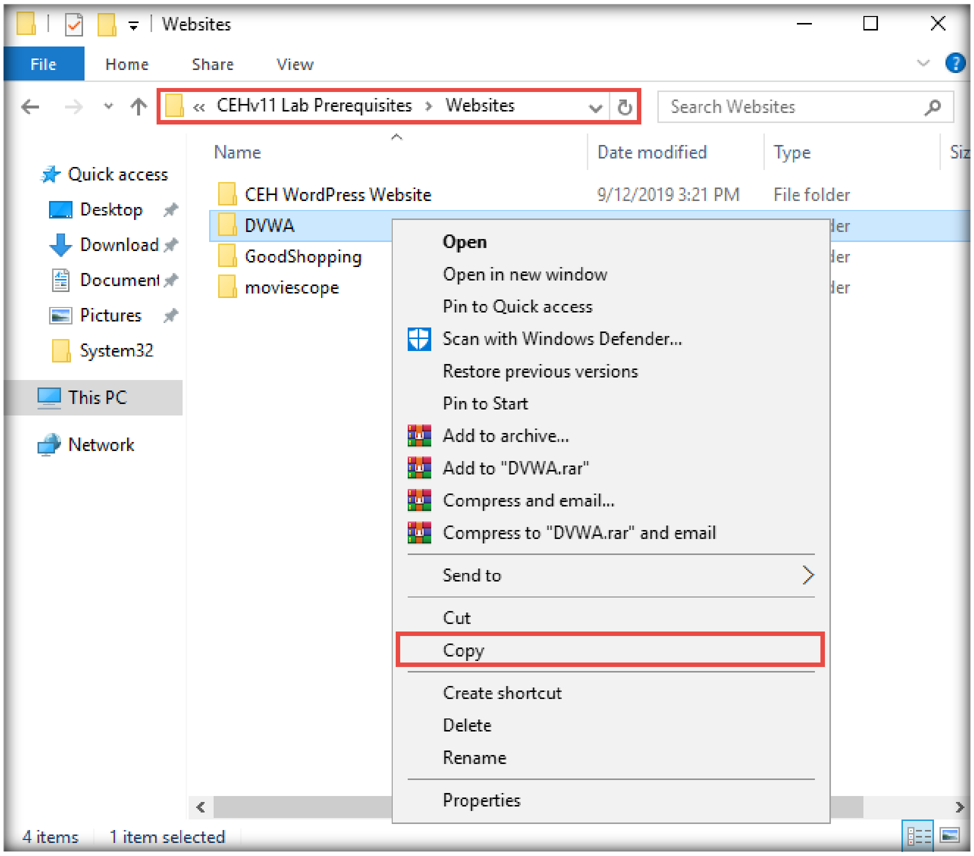

http://localhost:8080/phpmyadmin/server_privileg
localhost:8080 / MySQL | p...
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
dvwa
information_schema
mysql
performance_schema
sys
wordpress
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
More
[Edit inline] [ Edit ] [ Create PHP code ]
Database
Table
Routine
Console

You have added a new user.

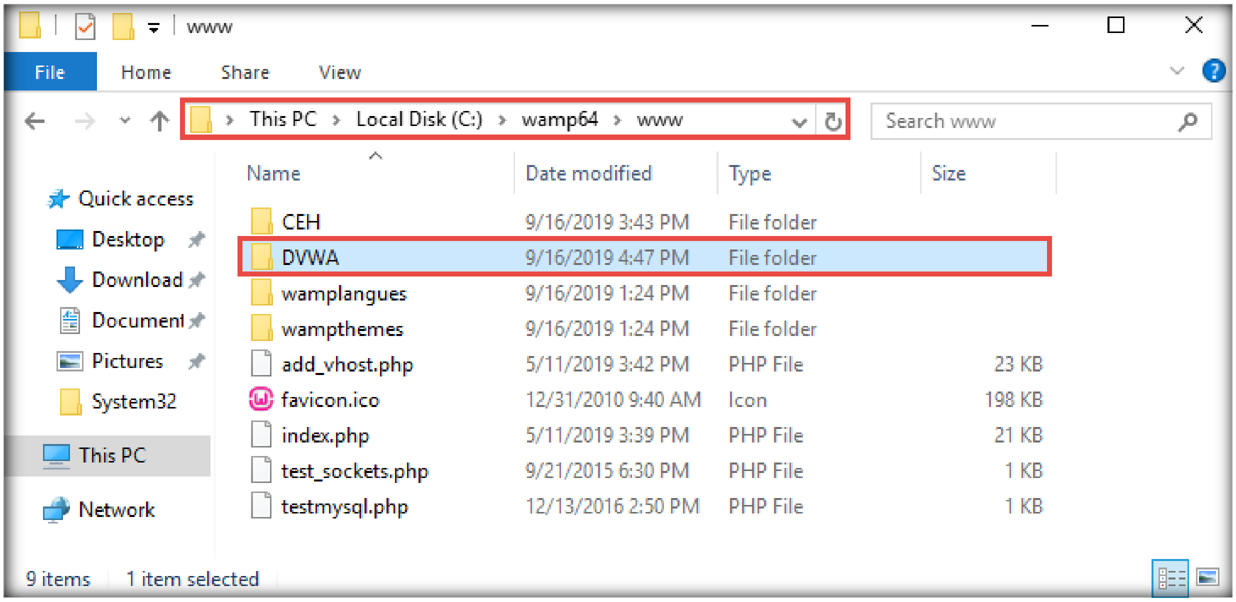
```
CREATE USER 'dvwa_user'@'localhost' IDENTIFIED WITH
mysql_native_password AS '***';GRANT ALL PRIVILEGES ON *.* TO
'dvwa_user'@'localhost' REQUIRE NONE WITH GRANT OPTION
MAX_QUERIES_PER_HOUR 0 MAX_CONNECTIONS_PER_HOUR 0 MAX_UPDATES_PER_HOUR
0 MAX_USER_CONNECTIONS 0;GRANT ALL PRIVILEGES ON `dvwa`.* TO
'dvwa_user'@'localhost';
```

12. Close the web browser.

13. Navigate to **Z:\CEHv11 Lab Prerequisites\Websites** and copy the **DVWA** folder.

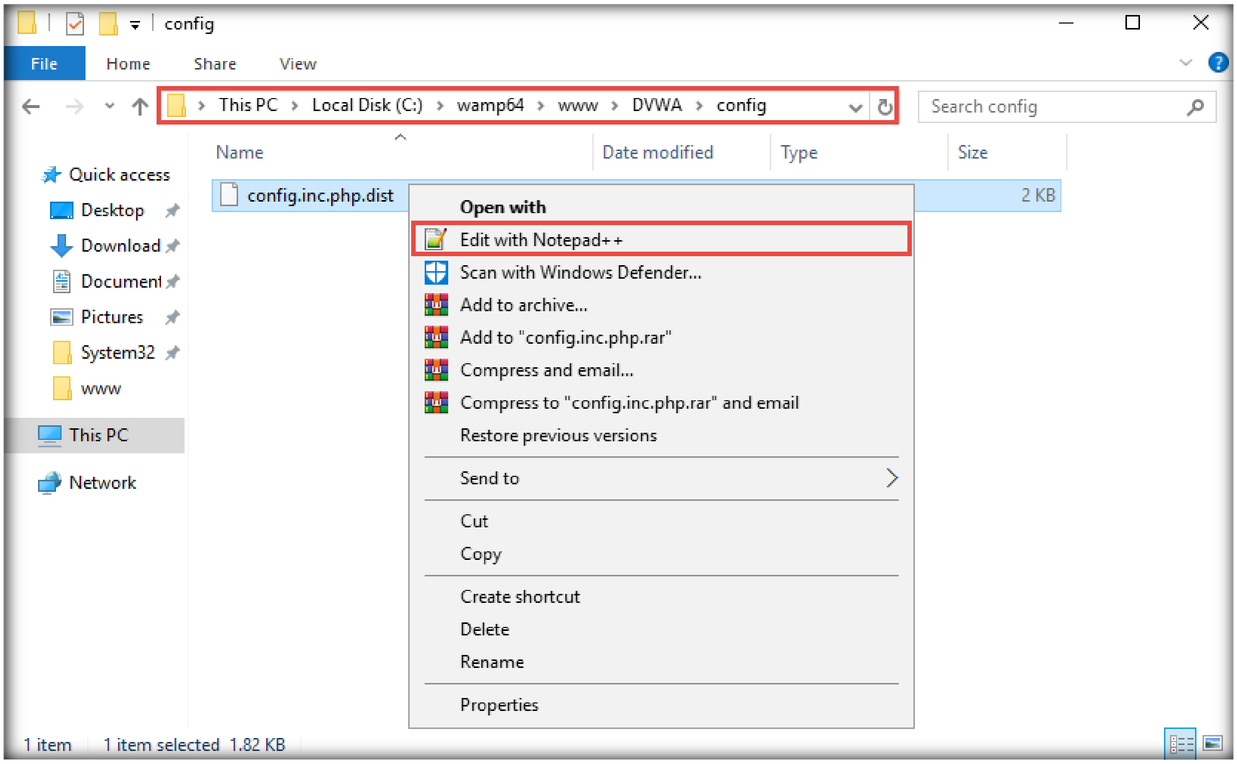

Websites
File
Home
Share
View
« CEHv11 Lab Prerequisites › Websites
Search Websites
Quick access
Desktop
Download
Document
Pictures
System32
This PC
Network
Name
Date modified
Type
Siz
CEH WordPress Website
9/12/2019 3:21 PM
File folder
DVWA
GoodShopping
moviescope
Open
Open in new window
Pin to Quick access
Scan with Windows Defender...
Restore previous versions
Pin to Start
Add to archive...
Add to "DVWA.rar"
Compress and email...
Compress to "DVWA.rar" and email
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties
4 items
1 item selected

14. Navigate to **C:\wamp64\www** and paste the **DVWA** folder that you copied in the previous step.


www
File
Home
Share
View
This PC > Local Disk (C:) > wamp64 > www
Search www
Quick access
Desktop
Download
Document
Pictures
System32
This PC
Network
9 items
1 item selected

| Name | Date modified | Type | Size |
|---|---|---|---|
| CEH | 9/16/2019 3:43 PM | File folder | |
| DVWA | 9/16/2019 4:47 PM | File folder | |
| wamplangues | 9/16/2019 1:24 PM | File folder | |
| wampthemes | 9/16/2019 1:24 PM | File folder | |
| add_vhost.php | 5/11/2019 3:42 PM | PHP File | 23 KB |
| favicon.ico | 12/31/2010 9:40 AM | Icon | 198 KB |
| index.php | 5/11/2019 3:39 PM | PHP File | 21 KB |
| test_sockets.php | 9/21/2015 6:30 PM | PHP File | 1 KB |
| testmysql.php | 12/13/2016 2:50 PM | PHP File | 1 KB |

15. Navigate to **C:\wamp64\www\DVWA\config** and open the **config.inc.php.dist** file with **Notepad++**.

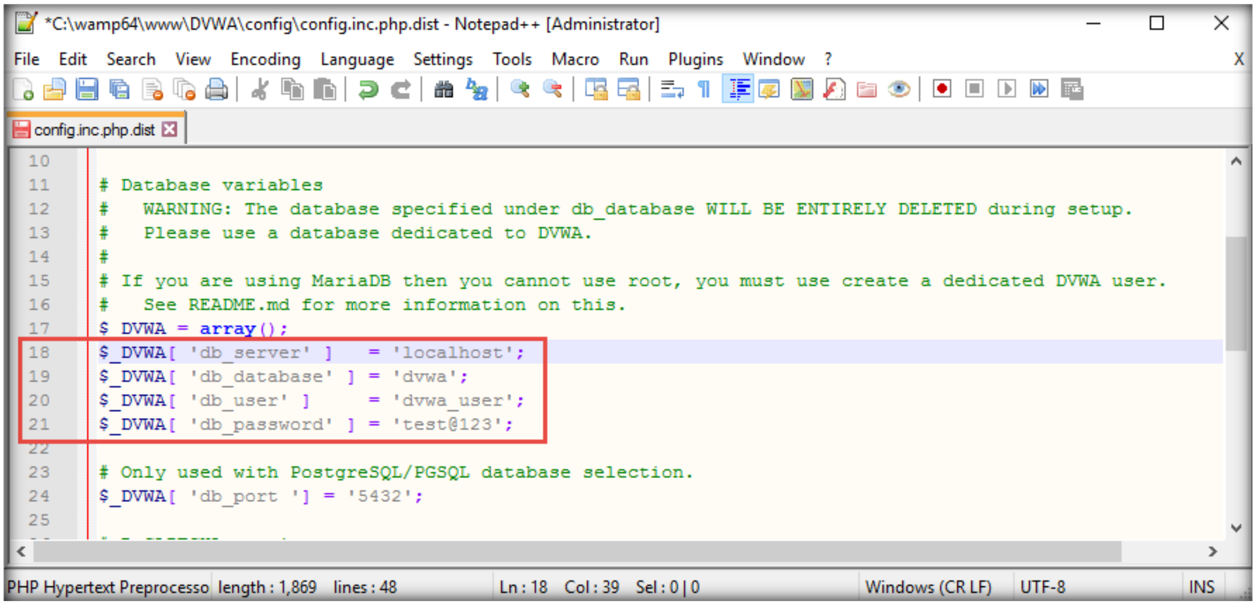

config
File
Home
Share
View
This PC > Local Disk (C:) > wamp64 > www > DVWA > config
Search config
Quick access
Desktop
Download
Document
Pictures
System32
www
This PC
Network
Open with
Edit with Notepad++
Scan with Windows Defender...
Add to archive...
Add to "config.inc.php.rar"
Compress and email...
Compress to "config.inc.php.rar" and email
Restore previous versions
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties
1 item
1 item selected 1.82 KB

| Name | Date modified | Type | Size |
|---|---|---|---|
| config.inc.php.dist | | | 2 KB |

16. **The config.php** file appears in **Notepad++**. Now:

- On **line no. 18**, assign the mysql database server host as **localhost** in single quotes
- On **line no. 19**, assign the database name as **dvwa** in single quotes
- On **line no. 20**, assign the mysql database username as **dvwa_user** in single quotes

- On **line no. 21**, assign the mysql database password as **test@123** in single quotes

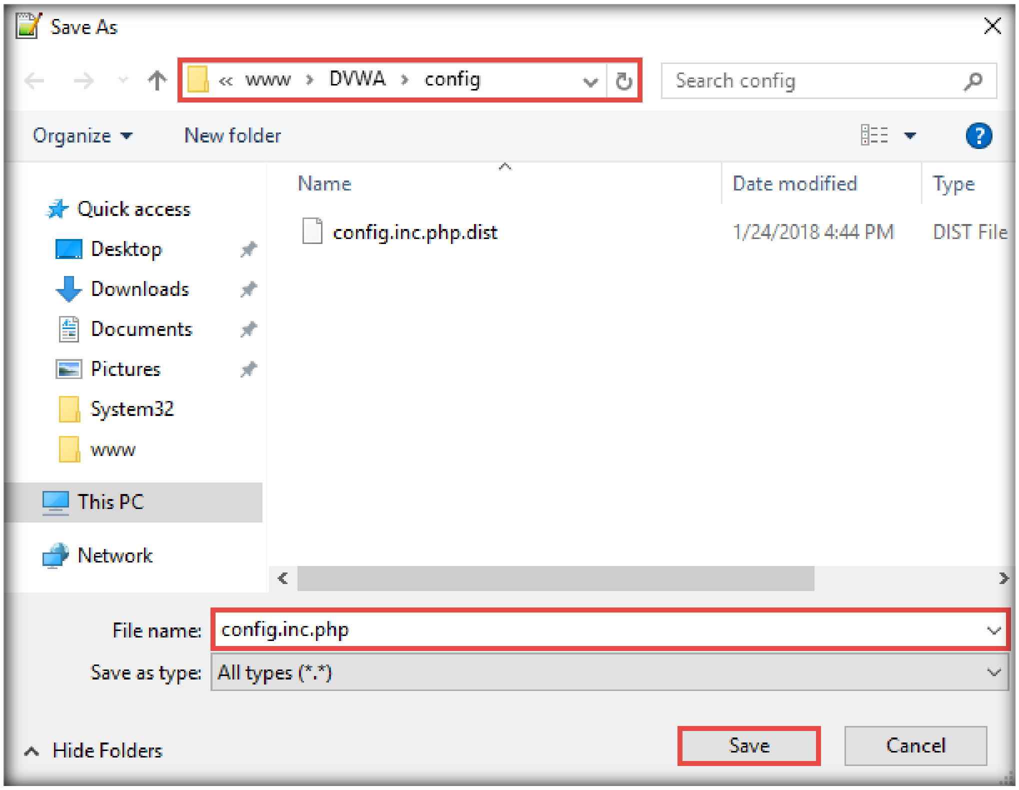


*C:\wamp64\www\DVWA\config\config.inc.php.dist - Notepad++ [Administrator]

```
10
11  # Database variables
12  #   WARNING: The database specified under db_database WILL BE ENTIRELY DELETED during setup.
13  #   Please use a database dedicated to DVWA.
14  #
15  # If you are using MariaDB then you cannot use root, you must use create a dedicated DVWA user.
16  #   See README.md for more information on this.
17  $_DVWA = array();
18  $_DVWA[ 'db_server' ]   = 'localhost';
19  $_DVWA[ 'db_database' ] = 'dvwa';
20  $_DVWA[ 'db_user' ]     = 'dvwa_user';
21  $_DVWA[ 'db_password' ] = 'test@123';
22
23  # Only used with PostgreSQL/PGSQL database selection.
24  $_DVWA[ 'db_port '] = '5432';
25
```

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
config.inc.php.dist
PHP Hypertext Preprocesso length : 1,869 lines : 48 Ln : 18 Col : 39 Sel : 0 | 0 Windows (CR LF) UTF-8 INS

17. Once done, press **Ctrl+S** to save the file.
18. Now, in the same file, click **File** from the menu bar; and from the context menu, click **Save As...**.
19. The **Save As** window appears; rename the file to **config.inc.php** and click **Save** to save in the same location (**C:\wamp64\www\DVWA\config**).
20. Once done, save the file in the **config** folder as **config.inc.php**.



Save As

« www › DVWA › config

| Name | Date modified | Type |
|---|---|---|
| config.inc.php.dist | 1/24/2018 4:44 PM | DIST File |

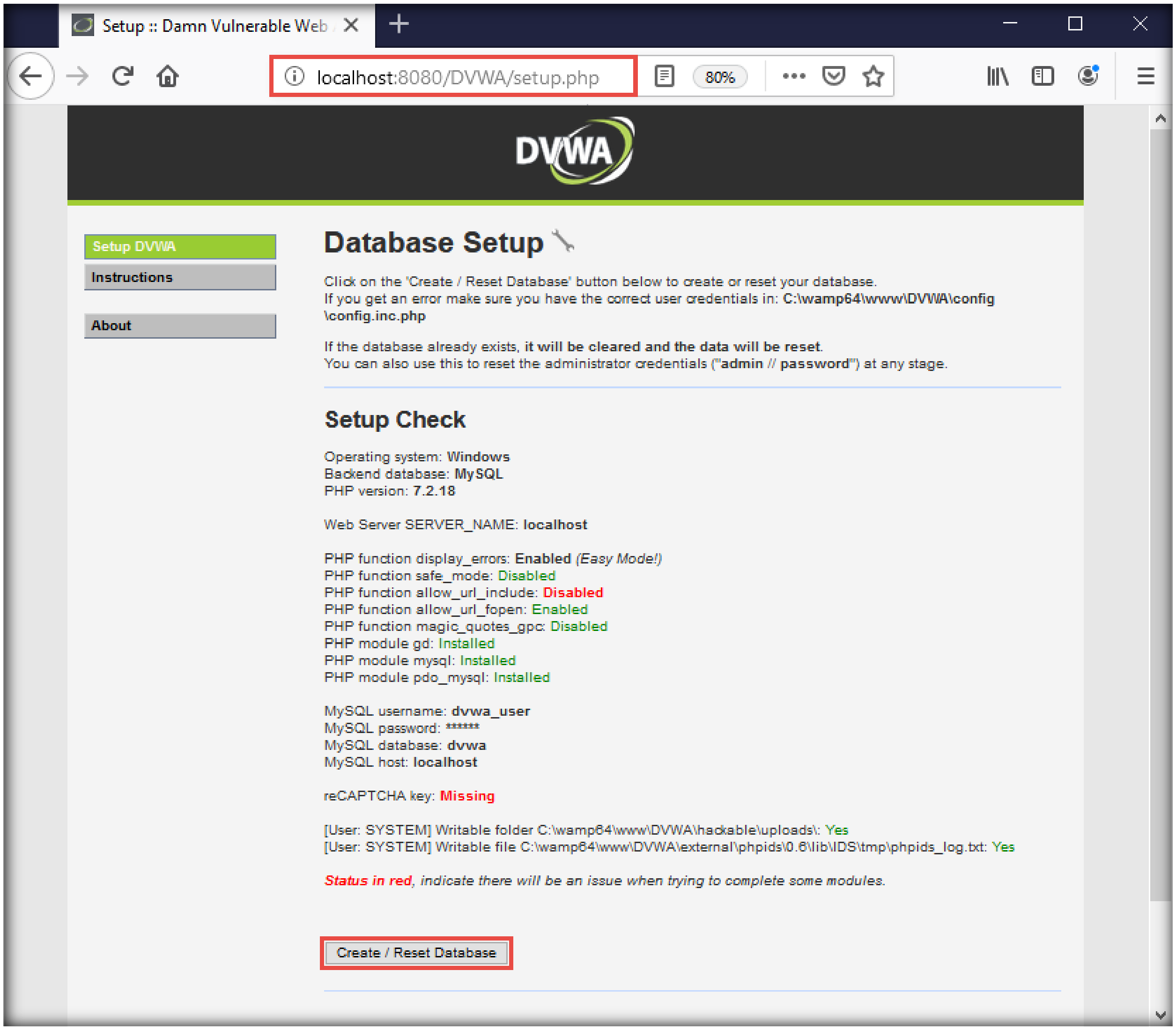
File name: config.inc.php

Save as type: All types (*.*)

Search config
Organize
New folder
Quick access
Desktop
Downloads
Documents
Pictures
System32
www
This PC
Network
Hide Folders
Save
Cancel

21. Launch a web browser, type the URL **http://localhost:8080/DVWA/setup.php** in the address bar, and press **Enter**.

22. The database setup webpage appears; click the **Create/Reset Database** button.



## Database Setup

Click on the 'Create / Reset Database' button below to create or reset your database.
If you get an error make sure you have the correct user credentials in: **C:\wamp64\www\DVWA\config\config.inc.php**

If the database already exists, **it will be cleared and the data will be reset.**
You can also use this to reset the administrator credentials ("**admin** // **password**") at any stage.

## Setup Check

Operating system: **Windows**
Backend database: **MySQL**
PHP version: **7.2.18**

Web Server SERVER_NAME: **localhost**

PHP function display_errors: **Enabled** *(Easy Mode!)*
PHP function safe_mode: Disabled
PHP function allow_url_include: **Disabled**
PHP function allow_url_fopen: Enabled
PHP function magic_quotes_gpc: Disabled
PHP module gd: Installed
PHP module mysql: Installed
PHP module pdo_mysql: Installed

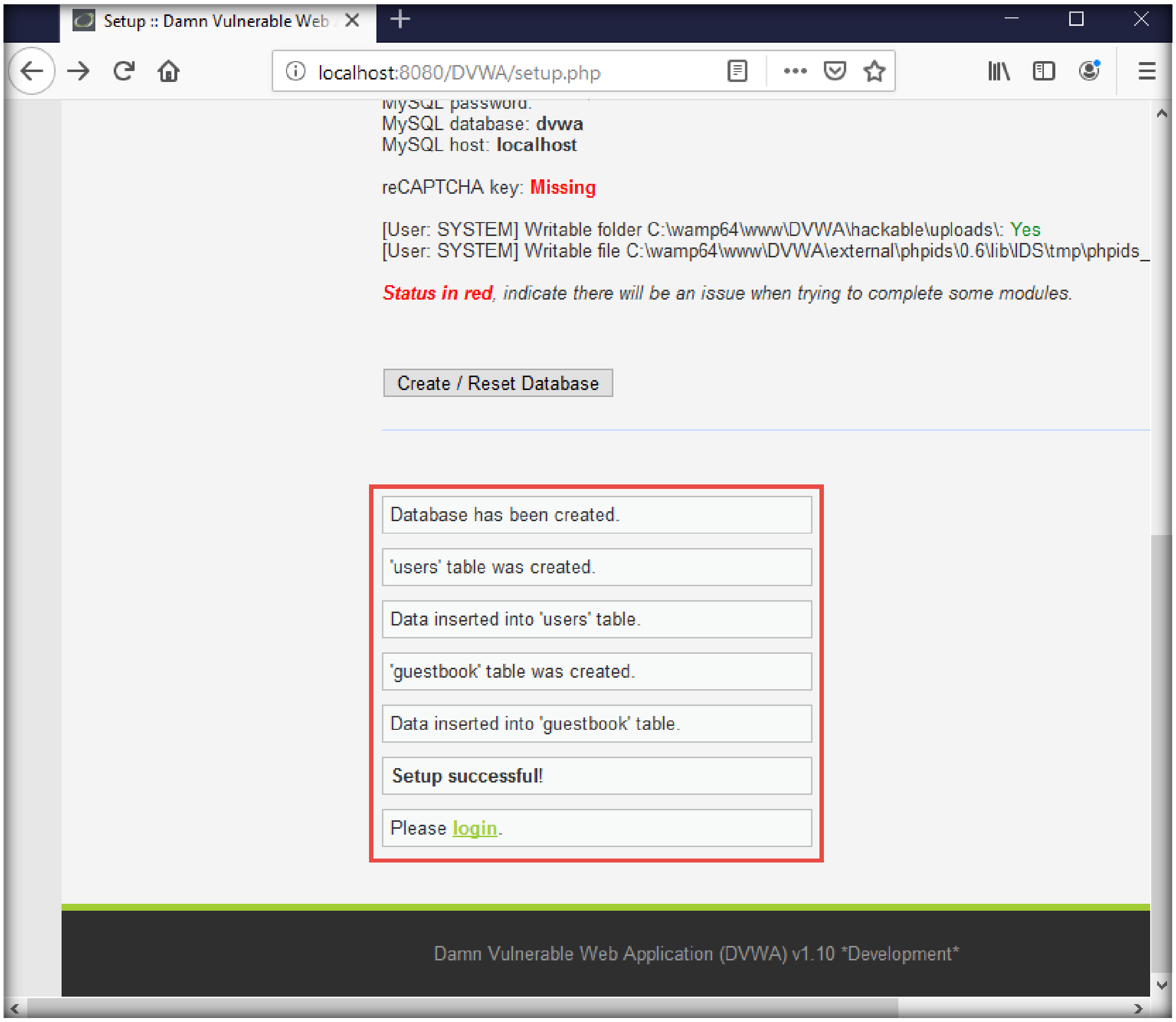
MySQL username: **dvwa_user**
MySQL password: **********
MySQL database: **dvwa**
MySQL host: **localhost**

reCAPTCHA key: **Missing**

[User: SYSTEM] Writable folder C:\wamp64\www\DVWA\hackable\uploads\: Yes
[User: SYSTEM] Writable file C:\wamp64\www\DVWA\external\phpids\0.6\lib\IDS\tmp\phpids_log.txt: Yes

***Status in red**, indicate there will be an issue when trying to complete some modules.*

23. The databases will successfully be created. Close the web browser.


Setup :: Damn Vulnerable Web
localhost:8080/DVWA/setup.php
Create / Reset Database

MySQL password:
MySQL database: **dvwa**
MySQL host: **localhost**

reCAPTCHA key: **Missing**

[User: SYSTEM] Writable folder C:\wamp64\www\DVWA\hackable\uploads\: Yes
[User: SYSTEM] Writable file C:\wamp64\www\DVWA\external\phpids\0.6\lib\IDS\tmp\phpids_

***Status in red****, indicate there will be an issue when trying to complete some modules.*

Database has been created.

'users' table was created.

Data inserted into 'users' table.

'guestbook' table was created.

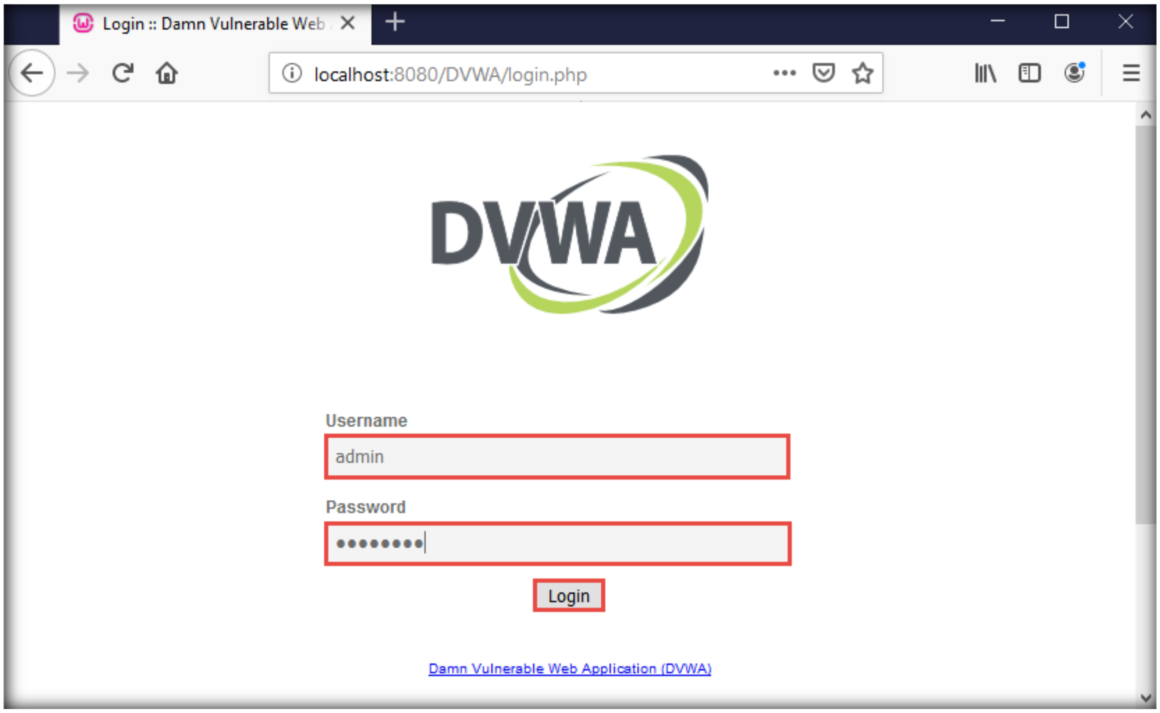
Data inserted into 'guestbook' table.

**Setup successful!**

Please login.

Damn Vulnerable Web Application (DVWA) v1.10 *Development*

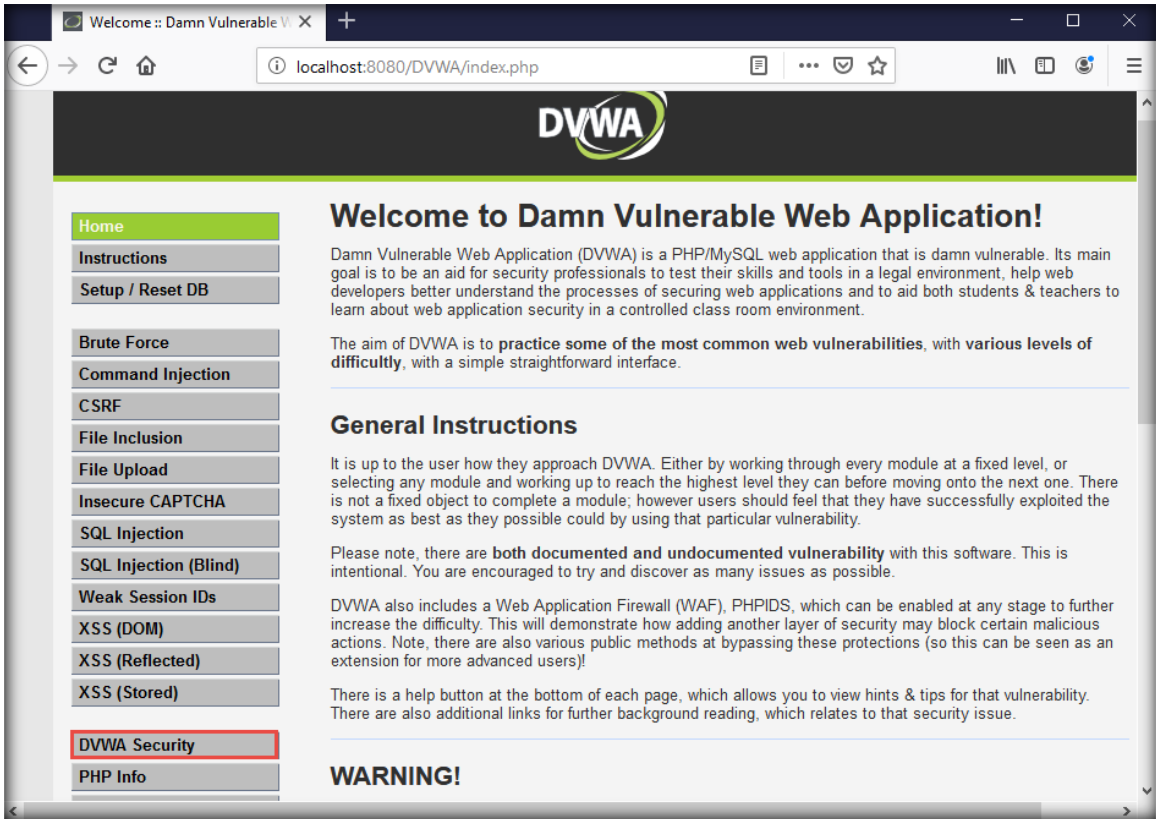
24. Now, type **http://localhost:8080/DVWA/login.php** in the address bar and press **Enter**. The **DVWA** login page appears; type **admin** in the **Username** field, **password** in the **Password** field, and click the **Login** button.


Login :: Damn Vulnerable Web
localhost:8080/DVWA/login.php
DVWA
Login
Damn Vulnerable Web Application (DVWA)

Username
admin

Password
••••••••

25. The admin page appears; click **DVWA Security** in the left pane.


Welcome :: Damn Vulnerable W
localhost:8080/DVWA/index.php
DVWA
Home
Instructions
Setup / Reset DB
Brute Force
Command Injection
CSRF
File Inclusion
File Upload
Insecure CAPTCHA
SQL Injection
SQL Injection (Blind)
Weak Session IDs
XSS (DOM)
XSS (Reflected)
XSS (Stored)
DVWA Security
PHP Info

Welcome to Damn Vulnerable Web Application!

Damn Vulnerable Web Application (DVWA) is a PHP/MySQL web application that is damn vulnerable. Its main goal is to be an aid for security professionals to test their skills and tools in a legal environment, help web developers better understand the processes of securing web applications and to aid both students & teachers to learn about web application security in a controlled class room environment.

The aim of DVWA is to **practice some of the most common web vulnerabilities**, with **various levels of difficultly**, with a simple straightforward interface.

General Instructions

It is up to the user how they approach DVWA. Either by working through every module at a fixed level, or selecting any module and working up to reach the highest level they can before moving onto the next one. There is not a fixed object to complete a module; however users should feel that they have successfully exploited the system as best as they possible could by using that particular vulnerability.

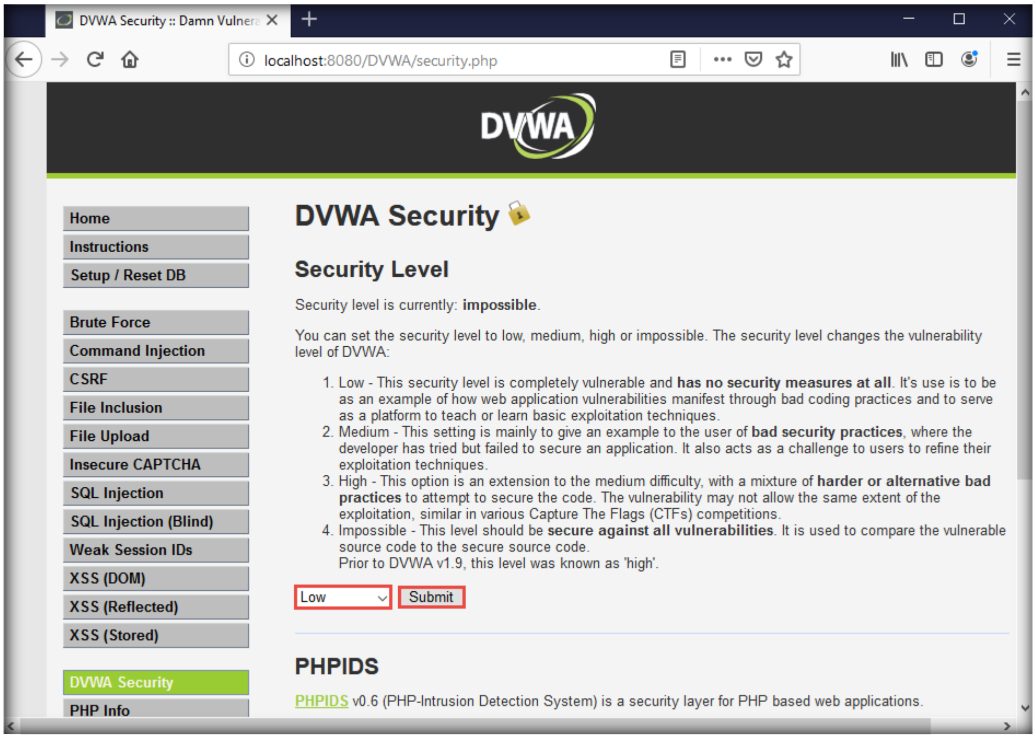
Please note, there are **both documented and undocumented vulnerability** with this software. This is intentional. You are encouraged to try and discover as many issues as possible.

DVWA also includes a Web Application Firewall (WAF), PHPIDS, which can be enabled at any stage to further increase the difficulty. This will demonstrate how adding another layer of security may block certain malicious actions. Note, there are also various public methods at bypassing these protections (so this can be seen as an extension for more advanced users)!

There is a help button at the bottom of each page, which allows you to view hints & tips for that vulnerability. There are also additional links for further background reading, which relates to that security issue.

WARNING!

26. The **DVWA Security** webpage appears. Select the **Low** option from the drop-down list and click **Submit**.


DVWA Security :: Damn Vulner
localhost:8080/DVWA/security.php
DVWA
Home
Instructions
Setup / Reset DB
Brute Force
Command Injection
CSRF
File Inclusion
File Upload
Insecure CAPTCHA
SQL Injection
SQL Injection (Blind)
Weak Session IDs
XSS (DOM)
XSS (Reflected)
XSS (Stored)
DVWA Security
PHP Info
Low
Submit

**DVWA Security**

**Security Level**

Security level is currently: **impossible**.

You can set the security level to low, medium, high or impossible. The security level changes the vulnerability level of DVWA:

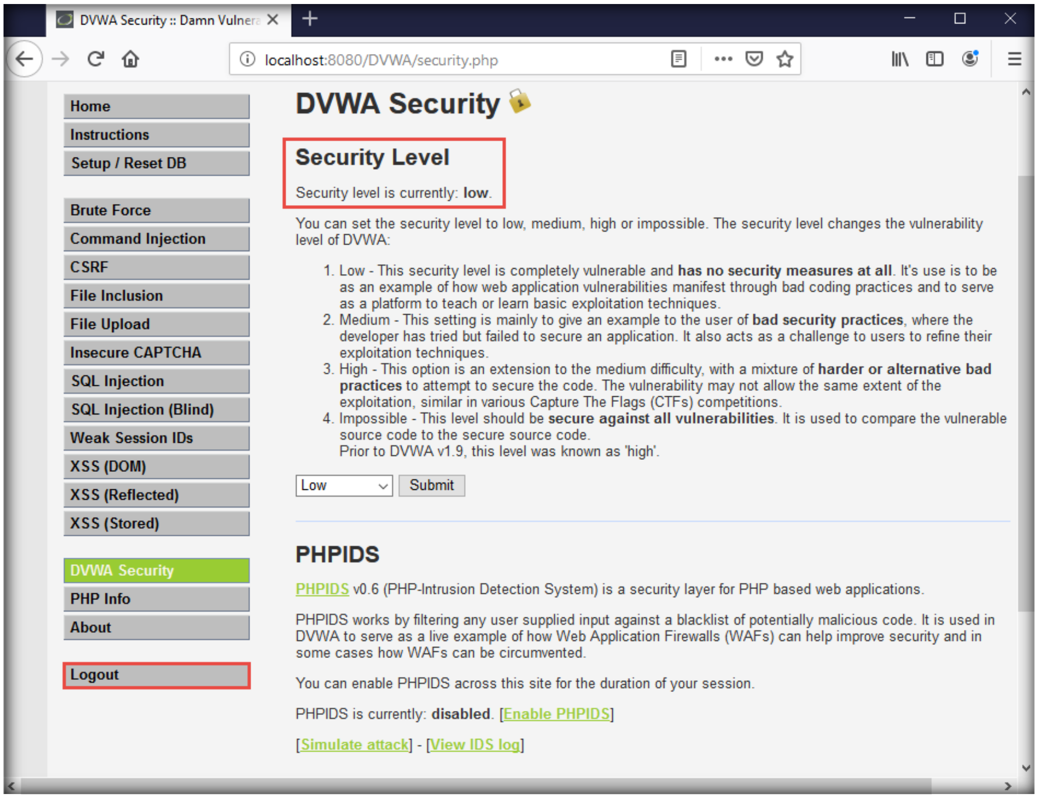
1. Low - This security level is completely vulnerable and **has no security measures at all**. It's use is to be as an example of how web application vulnerabilities manifest through bad coding practices and to serve as a platform to teach or learn basic exploitation techniques.
2. Medium - This setting is mainly to give an example to the user of **bad security practices**, where the developer has tried but failed to secure an application. It also acts as a challenge to users to refine their exploitation techniques.
3. High - This option is an extension to the medium difficulty, with a mixture of **harder or alternative bad practices** to attempt to secure the code. The vulnerability may not allow the same extent of the exploitation, similar in various Capture The Flags (CTFs) competitions.
4. Impossible - This level should be **secure against all vulnerabilities**. It is used to compare the vulnerable source code to the secure source code.
   Prior to DVWA v1.9, this level was known as 'high'.

Low | Submit

**PHPIDS**

PHPIDS v0.6 (PHP-Intrusion Detection System) is a security layer for PHP based web applications.

27. On configuring the security setting, click **Logout** in the left pane.


DVWA Security :: Damn Vulner
localhost:8080/DVWA/security.php
Home
Instructions
Setup / Reset DB
Brute Force
Command Injection
CSRF
File Inclusion
File Upload
Insecure CAPTCHA
SQL Injection
SQL Injection (Blind)
Weak Session IDs
XSS (DOM)
XSS (Reflected)
XSS (Stored)
DVWA Security
PHP Info
About
Logout
Low
Submit

**DVWA Security**

**Security Level**

Security level is currently: **low**.

You can set the security level to low, medium, high or impossible. The security level changes the vulnerability level of DVWA:

1. Low - This security level is completely vulnerable and **has no security measures at all**. It's use is to be as an example of how web application vulnerabilities manifest through bad coding practices and to serve as a platform to teach or learn basic exploitation techniques.
2. Medium - This setting is mainly to give an example to the user of **bad security practices**, where the developer has tried but failed to secure an application. It also acts as a challenge to users to refine their exploitation techniques.
3. High - This option is an extension to the medium difficulty, with a mixture of **harder or alternative bad practices** to attempt to secure the code. The vulnerability may not allow the same extent of the exploitation, similar in various Capture The Flags (CTFs) competitions.
4. Impossible - This level should be **secure against all vulnerabilities**. It is used to compare the vulnerable source code to the secure source code.
   Prior to DVWA v1.9, this level was known as 'high'.

Low | Submit

**PHPIDS**

PHPIDS v0.6 (PHP-Intrusion Detection System) is a security layer for PHP based web applications.

PHPIDS works by filtering any user supplied input against a blacklist of potentially malicious code. It is used in DVWA to serve as a live example of how Web Application Firewalls (WAFs) can help improve security and in some cases how WAFs can be circumvented.

You can enable PHPIDS across this site for the duration of your session.

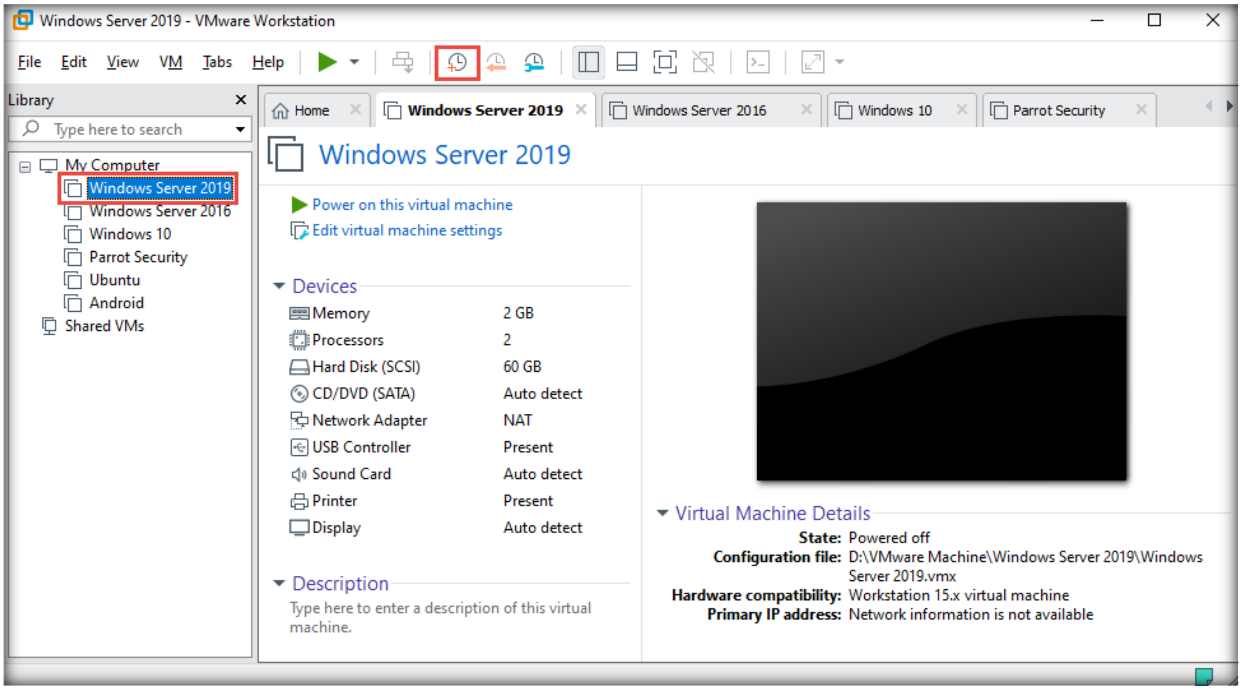
PHPIDS is currently: **disabled**. [Enable PHPIDS]

[Simulate attack] - [View IDS log]

[Back to Configuration Task Outline]

# CT#42: Taking Snapshots of the Virtual Machines

1. Make sure that all the virtual machines are turned off.
2. In the **VMware Workstation** window, click **Windows Server 2019** in the left pane, and click the **Take a snapshot of this virtual machine** ( ) icon, as the screenshot shows.

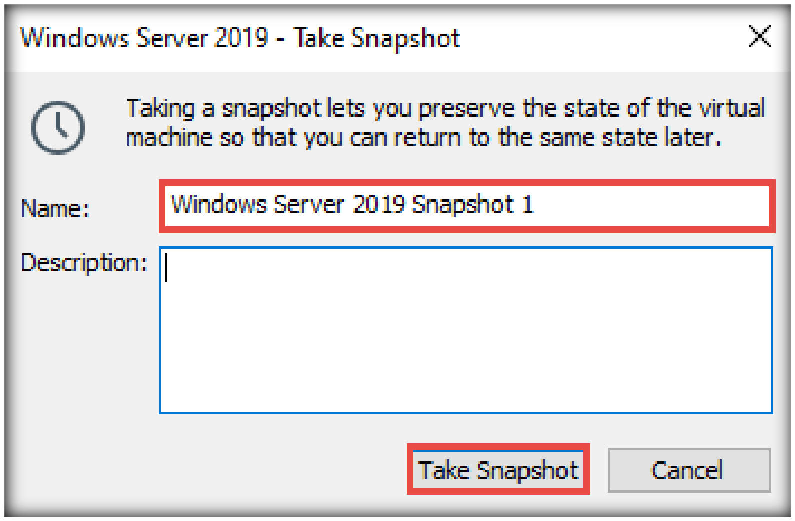

Windows Server 2019 - VMware Workstation
File
Edit
View
VM
Tabs
Help
Library
Type here to search
My Computer
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Ubuntu
Android
Shared VMs
Home
Windows Server 2019
Windows Server 2016
Windows 10
Parrot Security
Windows Server 2019
Power on this virtual machine
Edit virtual machine settings
Devices
Description
Virtual Machine Details

| | |
|---|---|
| Memory | 2 GB |
| Processors | 2 |
| Hard Disk (SCSI) | 60 GB |
| CD/DVD (SATA) | Auto detect |
| Network Adapter | NAT |
| USB Controller | Present |
| Sound Card | Auto detect |
| Printer | Present |
| Display | Auto detect |

Type here to enter a description of this virtual machine.

**State:** Powered off
**Configuration file:** D:\VMware Machine\Windows Server 2019\Windows Server 2019.vmx
**Hardware compatibility:** Workstation 15.x virtual machine
**Primary IP address:** Network information is not available

3. The **Windows Server 2019 – Take Snapshot** pop-up appears. Type a name for the snapshot in the **Name** field, leave the description field to default, and click **Take Snapshot**.


Windows Server 2019 - Take Snapshot
Take Snapshot
Cancel

Taking a snapshot lets you preserve the state of the virtual machine so that you can return to the same state later.

Name: Windows Server 2019 Snapshot 1

Description:

4. Similarly, take snapshots of the all virtual machines once all the CTs have been completed.

[Back to Configuration Task Outline]

End of the Document